Rubber Journal and International Plastics

VOL. 136 NO. 19 MAY 9 1959 Price 1s. Weekly

DIXIE 60

A BRITISH MADE HAF BLACK

HAF

DIXIE 60 processes easily and gives high resistance to abrasion and flex-cracking. DIXIE 60 is now manufactured in the UK to the same high standard of uniformity and quality maintained by its American counterpart over many years.

we are exhibiting international plastics exhibition olympia 17-27 June

ANCHOR CHEMICAL COMPANY LTD - MANCHESTER 11

London Office: Grand Buildings, Trafalgar Square, W.C.2
Scottish Agents: J. & G. Hardie & Co. Ltd., 178 Fulton Street, Glasgow, W.3
American Liaison and Service Branch: British Anchor Chemical Corporation, 366 Madison Avenue, New York 17, N.Y.

UNIVERSITY OF MICHIGAN
MAY 26 1959
ENGINEERING LIBRARY

ALL OVER THE WORLD
Discriminating Rubber Manufacturers
Choose
THE RUBBER REGENERATING CO. LTD.
AS THEIR MAIN
Suppliers of Reclaimed Rubber
Also suppliers of: DISPERSIONS, RUBBER LABELS, ACCELERATORS, ANTIOXIDANTS, PARACRIL RUBBERS, SYNTHETIC RUBBERS & RESINS
TRAFFORD PARK MANCHESTER, 17
TELEPHONE: Trafford Park 1424 TELEGRAMS: "Regenerate". CODE: Western Union Telegraph, Universal Edition

Editorial Director
JOHN D. COPEMAN

Editor
RICHARD ROWLAND

Consultant Editor
H. J. STERN
B.Sc., Ph.D., F.R.I.C., F.I.R.I.

Advertising Director
C. B. COPEMAN

Advertising Manager
A. S. KINGHAM

UK Area Representatives
M. J. Whelan, London

R. P. Finucane, Eastern Counties, Huntingdonshire, Hertfordshire, Bedfordshire, Buckinghamshire, Northamptonshire, Kent, Surrey and Sussex (Operating from London Office)

L. Quy, South and West of England and South Wales (Operating from London Office)

A. J. Legg, 55 Lee Lane West, Horsforth, Nr. Leeds. Tel. No. Horsforth 3845, North-East England, Lancashire, Yorkshire, Nottinghamshire, Lincolnshire and Derbyshire

W. Brown, 13 Allerton Road, Southport, Lancashire. Tel. No. Southport 5121, Scotland

E. A. Daniel, 'Brockenhurst,' 18 Thornhill Park, Streetly, Sutton Coldfield, Warwickshire. Tel. No. Streetly 1485, Midlands (excluding Staffordshire North of the A.5), Cheshire and North Wales

E. Burgess, 4 Kelvin Street, Maybank, Newcastle-under-Lyme. Phone 64678, Staffordshire North of the A.5

Foreign Representatives:
R. K. Larke, 7 Rue Pilaudo, Asnieres (Seine), France. Tel. No. Gresillons 42.24

G. Arnold Teesing, Rubensstraat 68, Amsterdam, Z (Netherlands). Tel. No. 727913

Albert Milhado & Co., G.m.b.H., Konigsallee 33, Dusseldorf, Germany, and Pompstraat 2, Antwerp, Belgium

Massimo Fano, Via V. Monti 14, Milan, Italy. Tel. No. Milan 808135

Rubber and International Plastics Journal

Volume 136 **Price 1s. Post free 1s. 4d.** **No. 19**

IN ITS 75th YEAR

May 9 1959

Editorial

NOTES OF THE WEEK 695

Articles and News

FACTICE-COMPENSATED ACCELERATION OF SBR ... 697
FBRAM ASSOCIATION AGMs 702
RUSSIAN TYRE FACTORY 703
RUSSIAN CONTRACT FOR COURTAULDS 704
NEW INTERNAL MIXER 711
MACHINE HIRE SCHEME 711
CORROSION EXHIBITION 712
INTERNATIONAL PLASTICS EXHIBITION 721

Features

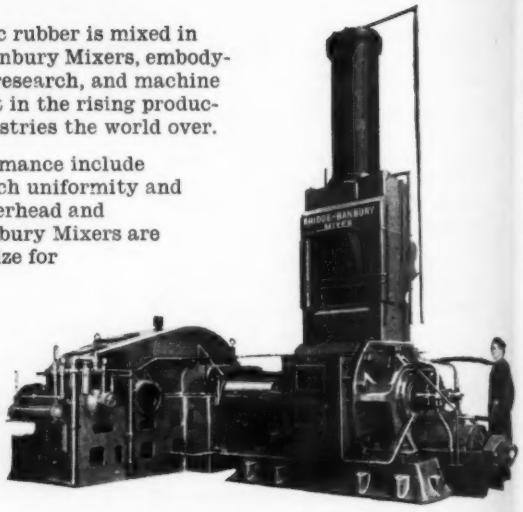
NEWS BRIEFS 696
VIEWS AND REVIEWS 706
QUESTIONS CORNER 708
MEN AND MATTERS 710
RUBBER MARKETS 718
INDUSTRY INTELLIGENCE 720

Classified Advertisements . . . 722 Advertisers Index . . . 726

MACLAREN HOUSE, 131 GREAT SUFFOLK STREET, LONDON, S.E.1
Grams: 'Buns, Souphone, London' Phone: HOP 5712
Annual Subscription, including Postage: United Kingdom and Oversea, £2 15s.; Index (half-yearly), 10s. per annum extra. Published weekly. Registered at GPO as a Newspaper. Registered for Transmission by Canadian Magazine Post. Entered as Second Class matter at Post Office, Boston, Mass, USA, under the Act of March 3, 1879 (Sec. 397 P. L and R.)

No less than 85% of the world's natural and synthetic rubber is mixed in Banbury Mixers.* Small wonder then, that Bridge-Banbury Mixers, embodying more than a generation of practical experience, research, and machine design, continue to play an almost indispensible part in the rising productivity of the ever-expanding rubber and plastics industries the world over.

Indisputable claims for Bridge Banbury Mixer performance include optimum dispersion, speedier mixing, consistent batch uniformity and quality, increased production and a lower labour, overhead and maintenance cost per unit of production. Bridge Banbury Mixers are designed for round-the-clock operation. There is a size for every production requirement. Ancillary machinery matched to deal with the increased output and further streamline the production flow is available. **Bridge-Banbury Automation is continuous production.**



Fully detailed technical information is freely available on request.

* *Banbury is a registered trade mark in many countries throughout the world.*

* BRIDGE - BANBURY MIXERS *

.... ACCLAIMED AS THE ULTIMATE IN MIXER EFFICIENCY

BRIDGE

DAVID BRIDGE & CO. LTD. CASTLETON, ROCHDALE, LANCASHIRE.

In technical association with Farrel-Birmingham Co. Inc. Ansonia, Conn. U.S.A.

'Phone Castleton, Rochdale, 57216 'Grams: Coupling. Phone Castleton Lancs.

London Office:
Broughton House, 6, 7, 8 Sackville St. Piccadilly, W.1. 'Phone Regent 7480. Grams & Cables: Ederaceo, Piccy, London.

NOTES of the WEEK

Prices and Habits

THERE is every indication that the present strong market position of natural rubber will be maintained throughout 1959. From the supply point of view, it does not appear that production, which, of course, tends anyway to be low at this time of the year, will differ greatly from the 1958 figure. At the same time, consumption has increased over the past few months, with usage in the US up by some 25% compared with the first quarter of 1958 and Russian buying at least maintaining last year's high levels. Longer term prospects for natural rubber can hardly be considered at today's prices, if only for the reason that their level must encourage manufacturers to consider the use of synthetic rubber—or more synthetic rubber—in place of natural. With the present gap between production and consumption of natural rubber showing little sign of decreasing, hence, of course, the upswing in market prices, and with demand increasing, such a move is already evident. In the US, for instance, a record amount of synthetic rubber, 111,256 long tons, was produced in the month of March 1959. Part of this can be accounted for by the improvement in new car and commercial vehicle sales but part also must be attributed to the price of natural. The point to be considered is that once manufacturers have made the move, they may well continue to use synthetic, and there can be habits in buying as well as in anything else. Quite apart from this, an increasing number of manufacturers are realizing the excellent qualities and wide range of modern synthetic rubbers.

Need for Technologists

THE need for control engineers and instrument technologists was stressed by Mr J. F. Coales in his presidential address to the Society of Instrument Technology. He pointed out that recent developments had resulted in a much greater awareness on the part of management of the need for research and development to provide new products and better ways of making them in order to remain competitive. As a result of this, he said, the more advanced industries are already employing large numbers of professional engineers and scientists, in many firms more than a tenth of the total number employed. At the same time, the number of technicians required for supervising equipment, maintenance and carrying out routine tests has increased enormously. Mr Coales went on to say that from statistics available it could be deduced that, in the UK, companies employing about 50% of the working population, some 12m. people, are dependent on technological advance for effective competition. It is probable therefore, he said, that the best estimate that can be made is to assume that a large part of British industry needs to have 10% of its employees fully qualified technologists as soon as possible, and, therefore, that of the 12,000,000 persons employed in industries dependent on technological advance, at least 5% of the fully employed, or 500,000, need to be qualified technologists now. Mr Coales proceeded to outline a number of reasons, such as increased automation, longer manufacturing runs, need for product design to offset to some extent raw material shortages, all of which make inevitable a greatly increased number of technologists. On the basis of the numbers in US industry, he estimated that this country needs at least 20,000 control engineers and about 100,000 instrument technicians. This means an annual output from universities and colleges of at least 500 control engineers and from technical colleges of at least 3,000 instrument technicians. When it is realized that there is hardly an industry in which automatic control and measurement does not play a part, it can be appreciated that the nation's need for technologists, so often stressed, must increase and that, therefore, plans to meet that need must grow with it.

Repetition

TELEVISION advertising may tend to make many viewers heartily sick of the endless repetition inherent in the business. Nevertheless, it is this repetion which leaves in the memory the jingles and catchphrases employed. In short, it largely achieves its objective. The value of steady repetition has been recognized by the Accident Prevention Committee for the Rubber Industry. Those excellent leaflets—referred to already in these columns—continue to appear. The latest, entitled 'Underlining,' stresses once more non-technical hazards. It reads: 'This is merely repetition. We are trying to underline the fact that in any factory most of the hazards which cause non-technical accidents are already well known. Foremen and operatives work amongst them. Without any particular thought probably they guard themselves against these hazards—the projection on the floor, the awkward step, the hot surface, the ladder with a broken rung. Things of this kind—and there are hundreds of them—cause no trouble to the man who knows and remembers them. The dangers are easily avoided. The trouble comes when someone forgets, or when a stranger comes amongst them. Our problem is really a simple one. We need to remind the man who has accepted and perhaps forgotten these hazards that they are hazards. His own local knowledge of what these are and where they are needs gathering in. Then we are ready to go to work on clearing up the hazards.'

NEWS *Briefs*

BRAZILIAN PVC — US RUBBER STRIKE ENDS
UNION CARBIDE POLYTHENE — SIERRA LEONE
NR—SUMATRA EXPORTS TO USSR—TYREX YARN

●**Chile**—Almost three-quarters of the rubber processed in Latin America is utilized for the manufacture of tyres, says an economic survey for 1958 issued by the Economic Commission for Latin America. The production of natural rubber in Latin America, the survey says, stands at a low level; some 23,000 tons are produced in Brazil and about 3,000 in all the other countries. Development by means of new plantations will take several years. There is every sign that supply difficulties will gradually increase during the next few years, the survey states.

●**United States** — America Enka Corporation has approved an expenditure to provide substantially increased production capacity for Tyrex viscose tyre yarn, it has been announced. The appropriation will be used to convert part of Enka's present rayon textile yarn operations to Tyrex. It is stated that 99% of US 1959 models use tyres of Tyrex cord as original equipment.

●**Sumatra** — Eight hundred tons of North Sumatran rubber has been shipped to Russia from the port of Belawan, Antara News Agency reports. This is part of a Russian order of 14,000 tons.

●**Sierra Leone**—A German expert, Dr W. Snoep, is carrying out investigations on the possibility of developing a rubber plantation in Sierra Leone. Dr Snoep is agricultural adviser to a group of Dutch bankers who are acting on behalf of the African Fruit Co. of Hamburg.

●**Brazil**—'Tubos Brasilit,' Sao Paulo, have installed machinery for large-scale manufacture of PVC tubes of ½in. and 4in. diameter for drinking water pipes and pipes for the food and chemical industries. Technical direction will be in the hands of the French firm 'SOFOM,' belonging to the Pont-a-Mousson group. Production is estimated at 400 tons per annum. 'Brasilit' is also beginning production of reinforced polyester plates for the civil engineering industry (production: 80 tons per annum).

●**United States**—One of the favourable elements in this year's natural rubber picture is the large increase in truck production in the United States over last year's relatively poor showing, 'Natural Rubber News' current issue states. Production in the first quarter of 1959 was 309,000 vehicles compared with only 228,000 in the same quarter of 1958, and was the best first quarter since 1956. Estimates of total 1959 production run to 1,100,000 vehicles compared with 871,000 in 1958—an increase of 26%.

●**Brazil**—The firm of CBE Companhia Brasileira de Equipamento has been set up in Sao Paulo with an initial capital of Cr$12 million for the manufacture of machines and equipment of the plastics industry. The founders of the new company are the Companhia Brasileira de Extrusao (makers of machines for extruding plastics) and a number of individuals.

●**United States** — Full commercial production of Type 6 nylon is now under way at the Hopewell, Virginia, plant of the Allied Chemical Corporation, according to Mr George H. Hotte, director of sales and service for the firm's national Aniline Division. The new type of nylon tyre yarn is based upon caprolactam monomer and is the result of 10 years of intensive research and development.

●**United States**—The United Rubber Workers Union and the United States Rubber Company have announced agreement on a new contract, ending the 22-day strike by more than 26,000 workers at the company's 18 factories. Details of the agreement will not be published until Monday, the joint announcement said, although workers will start returning to their jobs immediately. Terms of the agreement must be ratified by Union branches at all the factories involved.

●**Chile**—The free import of all goods has been decreed by the Chilean Government. The new ruling will come into effect once the guarantee deposits have been fixed. These deposits are made by importers to the Central Bank of Chile when they make their applications to import.

●**United States**—Plans for doubling Union Carbide's polythene production in the United Kingdom have been announced by Thomas F. W. Jackson, Chairman of Union Carbide Ltd. Existing facilities at Grangemouth, Scotland, will be augmented by another unit scheduled to produce 30m. lb. weight annually. It is anticipated that the new unit will be in production by late 1960. Bakelite Ltd., an affiliate of Union Carbide Ltd., long a major supplier of plastics materials in the UK, will distribute the output of the plant.

'Honest, we didn't cut the cure time—it's just that the steam's cooler than usual.'—438

Factice-Compensated Acceleration of SBR

By C. FALCONER FLINT, Ph.D., D.I.C., B.Sc., A.R.C.S., F.R.I.C., F.I.R.I.*

SUMMARY

After preliminary experiments, a detailed compounding study based on a type of 1502 SBR loaded with HAF black and accelerated with CBS (cyclohexyl benzthiazyl sulphenamide), has been carried out. It has been demonstrated that economies in SBR compounding can be effected by reducing the acceleration by 40% or more, compensating the adverse effects of this reduction by addition to the compound of a small (e.g. 5 phr) proportion of a low grade vulcanized fatty oil of an appropriate 'factice' type. This factice addition, without change in the time of cure given, is shown to maintain some properties (e.g. tensile and abrasion resistance) at the value observed before acceleration is reduced, actually to improve other properties (e.g. compression set, tearing energy, resilience and resistance to cut growth) and to be without adverse effect upon oven ageing characteristics. It is pointed out that the cost of the factic added need not be set off against the saving in accelerator cost because in the case of most SBR compounds, the volume cost of the factice added is actually less than that of the compound to which it is to be added, so that the factice actually cheapens the mix. Thus, the whole of the saving on acceleration is substantial and not merely apparent. In addition, the small addition of factice imparts valuable improvements to the processing properties of the compound, greatly enhancing (a) safety from scorch, (b) resistance to collapse after shaping, (c) docility to processing and shaping, and (d) extrusion rate and extrudate quality. This small addition of factice also promotes cool running on the mill and brings about a noticeable reduction in the time required for incorporation of the black. The term 'factice-compensated acceleration' is suggested, and systematic procedure for applying this principle to SBR compounding is discussed.

Introduction

INDICATIONS have been observed (Flint, Featherstone and Donnelly, *IRI Trans.*, Vol. 33, pages 187-9, 1957) that addition of a suitable type of vulcanized fatty oil (*factice*) affects favourably the vulcanizate properties of a GR-S compound. Further work has shown there are grounds for regarding these vulcanized fatty oils, used in small proportions, as essential components of a new and advantageous system for curing butadiene-styrene rubber (SBR), giving improved results and reducing the cost of acceleration. For convenience in what follows, the vulcanized fatty oils are designated by the familiar but unsuitable and misleading name (*factice*).

In this investigation, three SBR compounds (each loaded with 50 phr of GPF or HAF black and accelerated respectively with ZDC/MBT, MBT and CBS) were studied at optimum cure and were then modified with inclusion of factice. The principle adopted was to use the properties of the unmodified compound at optimum cure as the standard of comparison, modifying the compounds with one of four factice types, but without departing from the time of cure observed to give optimum properties in the unmodified compounds. Any claim that advantages may be secured by using factice in SBR compounds is obviously more acceptable when it does not involve any alteration in cure times already in use.

The compounds were modified (a) by merely adding a small proportion of factice, and (b) by also making a big reduction in the amount of accelerator used.

Mere addition of factice, without altering the time of cure given, favourably affected a number of important vulcanizate properties. It was also observed, again without altering the time of cure given, that the presence of a small proportion of factice would off-set to a remarkable extent the adverse effects otherwise attendant on major reductions in accelerator content. Some physical properties, indeed, were enhanced. There were also notable improvements in the ease of compounding and in processing characteristics of the compounds before cure.

The term 'factice-compensated acceleration' is suggested for this profitable and economically interesting method of using factice to obtain good SBR cures by the use of greatly reduced acceleration.

As already indicated, some vulcanizate properties appear to be enhanced by the factice-compensated acceleration of SBR cures; in the case of cut growth resistance, for example, the improvement is remarkable.

The Economics of Factice-compensated Acceleration of SBR

In an example studied in considerable detail later in this paper, it is proposed to reduce the CBS accelerator of the SBR compound from 1.0 phr to 0.6 phr. Considered on the basis of compounding 100lb. wt. of a type 1502 SBR, this would involve replacing 1.0lb. of CBS accelerator, costing about 62d. with 0.6lb. of CBS accelerator, costing only 37d. This reduced accelerator compound would cost about 21d. per volume lb. To compensate the effect of this reduction in acceleration, a quantity of grade three factice (based on rapeseed oil) costing about 63d. would have to be added. But the cost of this factice per volume lb. is only about 12.7d. This being less than the volume cost of the compound to which it is to be added, the addition of the factice would *reduce*, and not increase, the volume cost of the compound. Therefore, it would not be correct to disregard accelerator economy because it must be secured by an addition of factice.

For an exposition of the volume cost economics of compounding with

*Director of Research, Factice Research and Development Association, 12 Brook Road, Manchester 14.

factice, reference should be made to an earlier publication by the present writer (Falconer Flint, *Rubber Journal*, October 29 1955).

It must be emphasized (as will be seen in detail from the data given later in this paper) that not only is the addition of the factice advantageous by permitting accelerator economy and improving vulcanizate quality; the preparation of the compound, its dimensional stability, and its docility to shaping, are also much improved by this addition of factice. which actually reduces the cost of the compound.

Summary of Factice Effects on the ZDC/MBT/(GPF) Compound

The optimum cure of this compound was taken as the average of 10′ and 15′ cures at 153°C. The effects of adding 10 phr of a grade one rapeseed oil factice (see Table 2) were: 1. Compression set was reduced by 62%; 2. resilence was increased by 31%; 3. modulus was increased by 27%; 4. Geer oven ageing was unaffected.

The effects of reducing acceleration by 40% and compensating this by adding 10 phr of a grade one rapeseed oil factice (see Table 2) were 1. A 33% tensile fall, due to the accelerator reduction, was completely corrected by the factice; 2. a 66% modulus fall, due to the accelerator reduction, was completely corrected by the factice; 3. the Geer oven stiffening, caused by the accelerator reduction, was almost completely corrected by the factice (a 241% increase was reduced to 42%); 4. a 20% increase in resilience (in comparison with the unmodified high-accelerator compound); 5. a 50% reduction in compression set (in comparison with the unmodified high-accelerator compound).

Summary of Factice Effects on the MBT/GPF Compound

The optimum cure of this compound was 22′ at 141°C. The effects of adding 5 phr of a grade three rapeseed oil factice (see table 5) were: 1. A 15% increase in tensile strength; 2. a 30% increase in modulus; 3. a 10% decrease in elongation at break; 4. a 62% decrease in compression set; 5. Geer oven stiffening (modulus increase) was reduced from 96% to 71%; 6, Geer oven tensile change was corrected from an increase of 15% to a decrease of 6%; 7, Geer oven retention of elongation at break was little affected.

The effects of reducing acceleration by 66% and compensating this by adding 5 phr of a grade three rapeseed oil factice (Table 7) were: 1. A 68% fall in tensile strength, due to the accelerator reduction, was completely corrected by the factice; 2. an 84% fall in modulus, due to the accelerator reduction, was improved to only a 44% fall by the factice; 3. a 60% increase in elongation at break, due to the accelerator reduction, was improved to only a 42% increase by the factice; 4. the Geer oven modulus stiffening which was increased from 64% to 442% by the accelerator reduction, was reduced to 103% by the factice; 5. the Geer oven tensile change, which was altered by the accelerator reduction from a 4% fall to a 242% increase, was corrected by the factice to only a 24% increase; 6. the Geer oven change in elongation at break was little affected by the accelerator reduction, with or without added factice.

Summary of Factice Effects on the CBS/HAF Compound

The optimum cure of this compound was 40′ at 141°C. The effects of adding 5 phr of a grade one rapeseed oil factice (Table 9) were: 1. A 10% increase in tensile strength; 2, Slight softening—a modulus fall of 7% and a 2 point drop in hardness; 3. elongation at break was little affected. Oven ageing effects were not investigated.

The effects of reducing acceleration by 40% and compensating this by adding 5 phr of a grade one rapeseed oil factice (Table 9) were: 1. A 48% tensile fall, due to the accelerator reduction, was completely corrected by the factice; 2. a 78% modulus fall, due to the accelerator reduction, was reduced to only a 37% fall by the factice; 3. a hardness fall of 12 points, due to the accelerator reduction, was reduced to only a 4 point fall by the factice; 4. a 90% increase in elongation at break, due to the accelerator reduction, was partially corrected to only a 30% increase by the factice. Oven ageing effects were not examined.

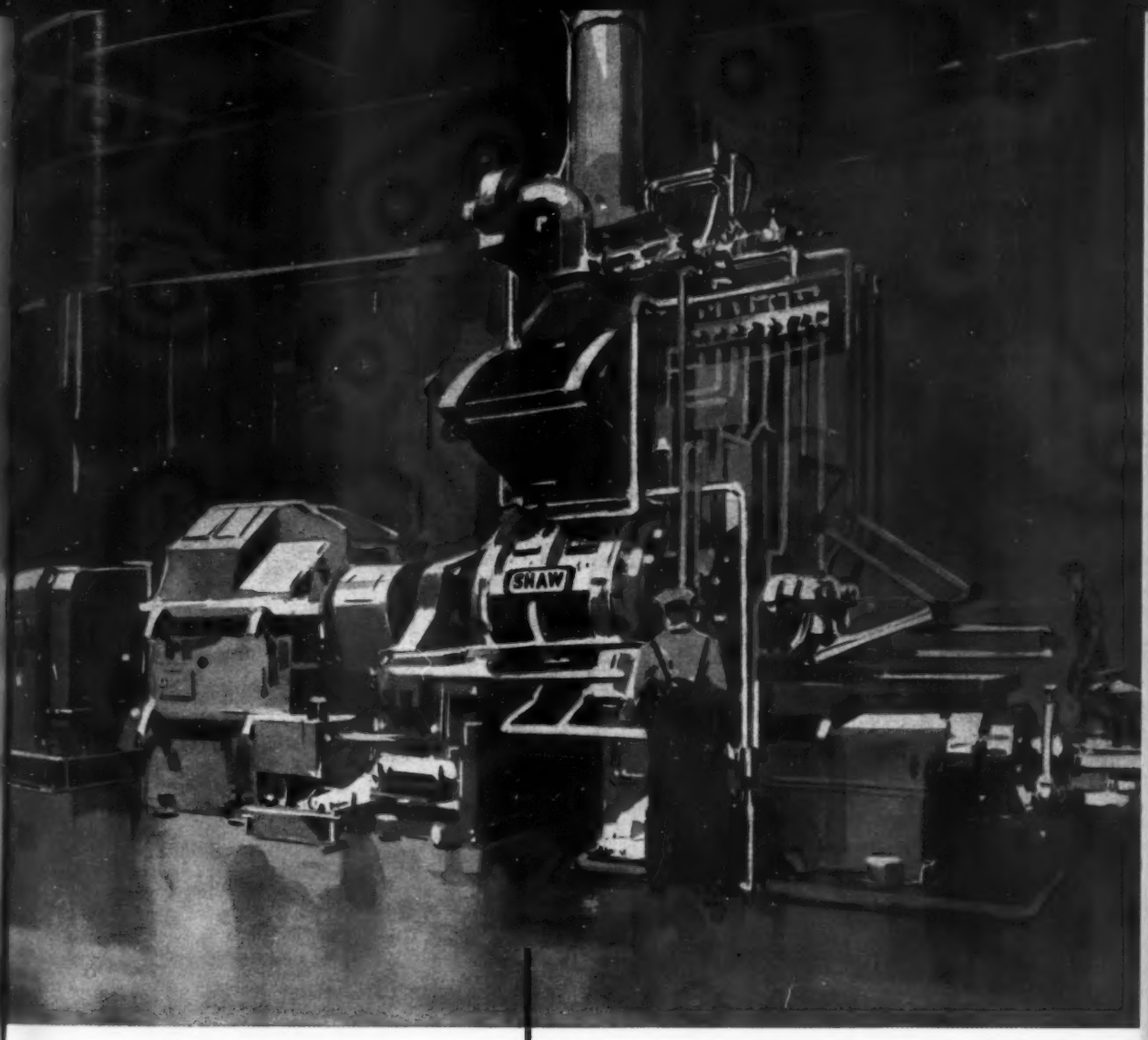
The effects of reducing acceleration by 40% and compensating this by adding 5 phr of a grade three rapeseed oil factice (Table 10) were: 1. A 50% tensile fall, due to the accelerator reduction, was completely corrected by the factice; 2. a 78% fall in modulus, due to the accelerator reduction, was partially corrected to only a 36% fall by the factice (as will be seen later, *compression* modulus was unaffected); 3. a 12 point fall in hardness, due to the accelerator reduction, was reduced by the factice to only a 2 point fall; 4. a 90% increase in elongation at break, due to the accelerator reduction, was partially corrected to only a 41% increase by the factice; 5. a 30% increase in compression set, due to the accelerator reduction, was completely corrected by the factice.

The effects on oven ageing of a 40% accelerator reduction, compensated by addition of 5 phr of a grade three rapeseed oil factice, were observed in another series of experiments (Table 11). These effects were: 1. Factice - compensated accelerator reduction slightly increased percentage retention of tensile strength (from 77% to 82%); 2. factice-compensated accelerator reduction slightly decreased the percentage retention of elongation at break (from 56% to 49%).

A number of vulcanizate properties, other than those already noticed above, were determined in the case of this CBS compound with a 40% reduction in acceleration, compensated by addition of 5 phr of a grade three rapeseed oil factice. The comparison is made with the high accelerator compound without factice, at the same time of cure. Effects observed (Table 12) were: 1. Resilience increased by 12%; 2. tearing energy slightly increased (by 3%); 3. compression modulus unaffected; 4. abrasion resistance unaffected; 5. cut growth resistance increased by 10 or more times.

These last five points, considered together in relation to the last named, make factice-compensated acceleration of SBR compounds of particular interest to the tyre industry.

Finally, an examination was made of the influence on stock compounding and processing characteristics of factice-compensated acceleration of the CBS compound (40% accelerator reduction, compensated by addition of 5 phr of a grade three rapeseed oil factice). In the following notes, comparison is with the normally-accelerated compound, in the absence of factice. The effects of factice-compensated acceleration were: 1. A reduction of 10°C. in the temperature reached during the mill mixing of the compound (Table 18); 2. a reduction of 23% in the total time required for mill mixing the compound and a reduction of 50% in black incorporation time (Table 19); 3. a reduction almost to zero of the Williams recovery figure of 20%, making the compound nerveless and docile to processing and shaping (Tables 14 and 15); 4. a marked stiffening of the raw stock (Williams compression) was observed, implying



SHAW INTERMIX for good compounding

Rubber compounding is as much an art as an exact science.

The consequent diversity in formulations calls for versatility of plant. The Shaw Intermix is the most versatile internal mixer for rubber, plastics, and allied materials because it has the following advantages:—

1. Rotors mounted on roller bearings.
2. Bi-metal construction of rotors for strength and wear.
3. Interlocking rotors for maximum mixing efficiency.
4. Cooling/heating chambers inside rotor nogs.
5. Easily renewable wear plates.
6. Efficient temperature control over all contact surfaces.

Francis Shaw

WE ARE EXHIBITING AT THE INTERNATIONAL PLASTICS EXHIBITION AT OLYMPIA 17-27 JUNE ON STAND 42

FRANCIS SHAW & COMPANY LIMITED · MANCHESTER 11 · ENGLAND
Telegrams: "Calender" Manchester Telephone: East 1415-8 Telex: 66-357

London Office: 22 Great Smith Street London SW1 · Telephone: Abbey 3245 · Telegrams: Vibrate London · Telex: 22250
Canada: Francis Shaw (Canada) Ltd Grahams Lane Burlington Ontario · Tel: Nelson 4-2350 · Telegrams: Calender Burlington Ontario

OVERSEAS AGENTS THROUGHOUT THE WORLD

P.2806

improved resistance of the compound to heat collapse (Tables 14 and 15); 5. a 43% increase in extrusion rate, together with complete correction of imperfections otherwise observed in the edge, surface and section of Garvey die extrudates (Table 16); 6. a 15% improvement in safety to scorch at 120°C. Further, it will be appreciated that the lower running temperature (1 above) would almost double the mixing safety of the compound (Table 17).

Applying the Principle of Factice-Compensated Acceleration to SBR Compounds

The present paper is only an introduction to this principle, and cannot claim to be an exhaustive study of it. It will be appreciated that in seeking to apply the principle to an established compound, there are four variables, namely, time of cure (at the selected temperature), percentage reduction of accelerator content, amount of factice added, and type of factice used. The original compound is unlikely to show a perfect combination of vulcanizate properties for its service application, but is probably just an acceptable compromise. By the interdependence of the vulcanizate properties that can be secured by compounding, it follows that the selection of desirable levels for properties essential to the service application will fix other properties also, resulting in a combination that may be an indifferent compromise. Factice-compensated acceleration appears greatly to widen the range of property-combinations obtainable with SBR. In seeking to apply this principle to a particular case in hand, the rubber technologist should himself work out the best values, in this instance, for these four variables (time, accelerator content, factice content, and factice type). He should keep in mind that he is likely to secure greater advantages than the mere maintenance of the properties of his original compound on a revised and cheaper basis. He is likely to formulate an improved compound and he should be alert to take full advantage of these opportunities.

Factice Compounding Rules—Moderation

The sulphur-vulcanized fatty oils conventionally known to the UK rubber industry by the product name of *factice* (a thoroughly unsatisfactory name with an inappropriate mental background) appear to act in two ways in elastomeric compounds, (a) by chemical participation in the vulcanizing system, and (b) as mere physical addenda, their effect on a particular polymer being modified by compatibility and lubricating action.

The physical and chemical effects appear sometimes to work in opposition, and the observed effect is the resultant of these two effects and depends on which predominates. The indications are that the chemical effects appear when quite small proportions of factice are used, and may not be overcome by physical effects unless much larger amounts are added.

From the above, it follows that when seeking the help of factice in the formulation of compounds, the technologist should never be disappointed if the desired effect is not secured with the first proportion tried, or even if the effects observed are the opposite of those desired. In such cases, a wide range of factice proportions should be tried in the compound. This is the first and great rule in seeking the help of factice. And the second rule is, *moderation*. These vulcanized fatty oils are most powerfully effective compounding ingredients. In exploring a range of proportions, it is wise practice to start low, and then go higher until the desired effect is achieved.

EXPERIMENTAL

MBT Compound Activated with ZDC

Work was first carried out with the SBR compound (shown in Table I) in which the accelerator used was MBT activated with 1 in 15 parts of ZDC.

TABLE 1

	Parts by weight
SBR (low-temperature polymer type 1502)	100
Stearic acid	2.0
Zinc oxide	5.0
GPF black	50
Processing aid ('amended oil residues')	5
Sulphur	2
Accelerator*	1.6 or 1.0
PBN antioxidant	1
Factice	0 or 10

* MBT activated with 1/15th times its weight of ZDC and added in masterbatch form.

MBT—ZDC/GPF/SBR Compound

The factice used was designated RO1—a grade one dark (sulphur) factice based on rapeseed oil, having a hot acetone extract value of 19.3% and a free sulphur content (method of Bolotnikov and Gurova) of 1.6%. The designations adopted for these four compounds were as follows: 'Control'—high (1.6) accelerator, no factice; 'high, factice,'—high (1.6) accelerator, 10 phr factice; 'blank'—low (1.0) accelerator, no factice; 'low factice'—low (1.0) accelerator, 10 phr factice.

The four variations indicated in the formula for this compound (Table 1) were mixed on open rolls maintained at a surface temperature of 80°C. and cured at 153°C. Preliminary work established that for the *control* (high-accelerator-no-factice) compound at this temperature, a satisfactory picture of the physical properties of an optimum cure was obtained by averaging data for the 10min. and 15min. cures.

Physical test results obtained by averaging the figures from the 10′ and 15′ cures at 153°C. of each of these four mixings, before and after 7 days accelerated ageing in an air oven at 70°C., are given in Table 2.

Factice Addition Effects on ZDC-activated Compound

It will be observed that the effect of this factice (10 phr) on the control appeared to be to increase the modulus quite considerably, leaving the tensile strength and the elongation at break substantially unchanged. After oven ageing, the percentage retention of these extension properties was not affected to any significant extent by the addition of factice. Resilience was considerably increased and compression set greatly reduced.

Factice Compensation of ZDC-activated Compound

From Table 2 it remains to see the effect of reducing total acceleration by 40% (from 1.6 to 1.0) and the possibility of using the action of factice on rate and state of cure to compensate this.

The effect of this reduction in acceleration was greatly to reduce modulus and tensile strength, with relatively little change in elongation at break. After the oven ageing, however, the modulus of the blank had become higher than that of the control, the tensile strength of the blank was approaching that of the control, and the elongation at break had shown serious deterioration compared with that of the control. This reduced acceleration appeared to have little effect on resilience and compression set. Addition of factice to the low accelerator compound appears to have restored both the modulus and the tensile substantially to their original values in the high accelerator compound, without affecting the elongation at break. During the period of oven ageing, the factice compensated vulcanizate behaved similarly to the control in respect of percentage reten-

Director of Research:
C. Falconer Flint,
B.Sc., Ph.D.(Lond.), A.R.C.Sc., D.I.C., F.R.I.C., F.I.R.I.

Laboratories:
12 Brook Road,
Fallowfield, Manchester 14

Telephone: Rusholme 5198

FRADA

FACTICE RESEARCH AND DEVELOPMENT ASSOCIATION

Serves FACTICE users by co-operative research

QUALITY FACTICES SUPPLIED BY FRADA MEMBERS

J. Allcock and Sons Ltd - Manchester

Anchor Chemical Co. Ltd - Manchester

British Recovered Rubber and Chemical Co. Ltd - Manchester

Durham Raw Materials Ltd - Birtley

Hubron Rubber Chemicals Ltd - Manchester

Alfred Smith Ltd - Hull

tion of elongation and tensile, but showed a greater tendency to stiffen (increase in modulus). It is particularly noticeable that the addition of factice appears completely to have corrected, in the reduced accelerator compound, the serious adverse effect of oven ageing on elongation retention. The factice compensated vulcanizate was higher in resilience and much lower in compression set than the control.

TABLE 2

Test applied	No factice		With 10 phr RO1 factice	
	Control (High acceleration)	Blank (Low acceleration)	(High acceleration)	(Low acceleration)
300% Modulus (psi):				
BA	1,080	368	1,374	1,018
AA	1,135	1,257	1,510	1,448
% Retention ..	105	341	110	142
Tensile strength:				
BA	2,396	1,602	2,362	2,275
AA	2,406	1,956	2,475	2,214
% Retention ..	100	122	105	97
Elongation at break:				
BA	700	800	700	713
AA	615	490	617	570
% Retention ..	88	61	88	80
Yerzley resilience* ..	49	48	64	59
Compression set† ..	7.5	7.4	2.7	3.6

* See Falconer Flint, *RJ*, Nov. 9 and 16 1957; Flint, Featherstone and Donnelly, *Trans. IRI*, 1957, **33**, 104, figs. 5 and 6.

† Twenty-four hours at 20°C. under 30% deflection between glass paper surfaces, 1 hour recovery at 20°C., expressed as a percentage of the uncompressed (original) height

MBT-ZDC/GPF/SBR compound. Figures are average of 10′ and 15′ curves at 153°C. High acceleration = 1.6 total; low acceleration = 1.0 total (i.e. reduction by 40%). BA = before ageing; AA = after 7 days in an air oven at 70°C.

The value of factice in compensating a 40% reduction in accelerator in this SBR compound appeared without change in the time of cure given. As compared with the control values modulus, tensile and elongation at break were maintained, resilience was increased and compression set reduced, all without any indication of adverse effect on oven ageing properties.

Factice Effects on Processing of ZDC-activated Compound

It was observed that addition of 10 phr of this factice had a stiffening effect on the compound, raising the Mooney viscosity of the control (1.6 accel. no factice) by 12 units and raising the Mooney viscosity of the blank (1.0 accel. no factice) to 14 units above the control value. Mooney scorch times at 120°C. for the control, and for the low accelerator compound compensated with 10 phr of this factice, were not significantly different.

Four Factice Types Studied for Compensation Effects

The position was then examined again, using a simple accelerator system (MBT alone), reducing the quantity of factice added to 5 phr and now examining four factice types, designated as follows: RO1—grade one factice based on rapeseed oil; RO3—grade three factice based on rapeseed oil; GO1—grade one factice based on other glyceride oil; GO2—grade two factice based on other glyceride oil.

Hot acetone extract values and free sulphur values for the actual factices used will be found in Table 3.

TABLE 3

Factice type designation	Acetone extract value*	Free sulphur†
RO1‡	12.5%	1.5%
RO3	49.3%	2.1%
GO1	19.1%	1.4%
GO2	35.0%	1.0%

* Five hours Knoeffler extractor.

† Method of Bolotnikov and Gurova (see Carrington, *Trans. IRI*, 1935, **3**, 302).

‡Another sample of RO1 was used to obtain the results given in Tables 2 and 5. This had AE value 19.3% and FS value 1.6%.

(To be continued)

T. Smeaton Dick

The death is announced of Mr T. Smeaton Dick, 66, former district manager of Pirelli Ltd. at Cardiff. Mr Smeaton Dick joined Pirelli Ltd. as a representative in January 1930. He was appointed manager of the Cardiff branch in 1950, which post he held until his retirement at the end of March last year.

Mr R. E. Huffam, who recently retired from the board of Unilever Ltd., has accepted an invitation to join the board of A. Boake, Roberts and Co. (Holding) Ltd.

FBRAM

ASSOCIATION AGMs

A NUMBER of member associations of the FBRAM held their annual general meetings last week. The following elections were made: Mr I. F. Jones of Reliance Rubber Co. Ltd., was re-elected chairman for 1959-60, of the British Rubber Hot Water Bottle Manufacturers' Association.

Mr A. W. Hopkins of The General Electric Co. Ltd., was re-elected chairman for 1959-60 of the Association of British Ebonite Manufacturers.

At the annual general meeting of the British Rubber Flooring Manufacturers' Association the following were elected for 1959-60: Chairman, Mr B. M. Fawkes, Rubberware Ltd.; vice-chairman, Mr T. H. Brooke, Redfern's Rubber Works Ltd.

Mr David D. Marshall of the Greengate and Irwell Rubber Co. Ltd., was re-elected chairman for 1959-60, of the British Rubber and Plastics Belting Manufacturers' Association.

Mr G. F. Carr, of Dunlop Rubber Co. Ltd., was re-elected chairman for 1959, of the British Latex Foam Manufacturers Association.

At the annual general meeting of the British Seamless Rubber and Plastics Manufacturers' Association the following officers were re-elected for 1959: Chairman, Mr S. D. Sutton, Veedip Ltd.; vice-chairman, Mr A. R. Reid, London Rubber Co. Ltd.

At the annual general meeting of the British Cellular Rubber and Plastics Manufacturers' Association held on May 1 the following officers were elected for 1959-60: Association chairman, Mr W. T. L. Becker, Volcrepe Ltd. Cellular Rubber Section: Chairman, Mr A. Wrigley, Sorbo Ltd., vice-chairman, Mr D. J. Scott, St. Albans Rubber Co. Ltd. Plastic Foam Section: Chairman, Mr G. F. Carr, Dunlop Rubber Co. Ltd.; vice-chairman, Mr J. H. Webb, Kay Brothers Plastics.

US RUBBER RECORDS

The rubber manufacturing industry in the US set two new records during the month of March 1959. New rubber consumption amounted to 146,815 long tons for a new monthly high, while production of all types of synthetic rubber reached 111,256 long tons in the same period, according to the monthly report of the Rubber Manufacturers Association Inc.

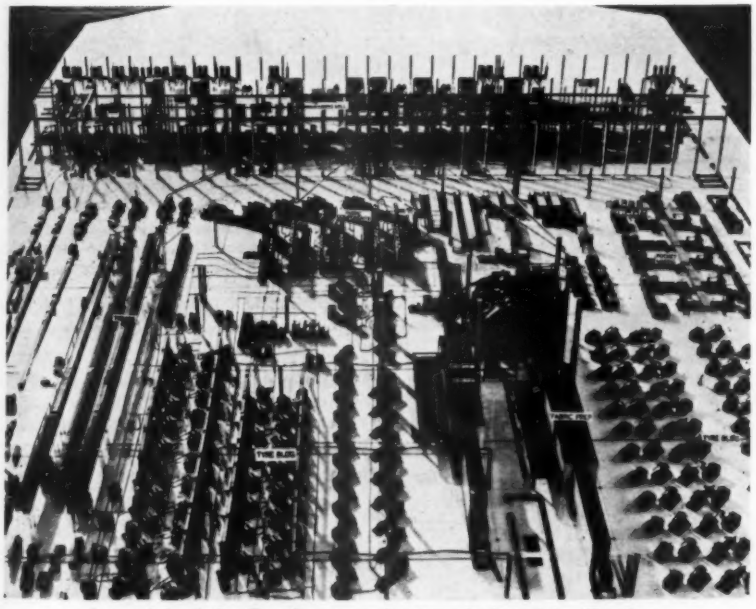
Russian Tyre Factory

RUSTYFA CONTRACT DETAILS ANNOUNCED

DETAILS of the £14m. worth of equipment to be supplied by the Consortium of British firms to the tyre factory now building at Dniepropetrovsk in the USSR were announced last week.

The factory—1,170ft. long and 570ft. wide—17½ acres in floor area, is on a 79 acre site; will employ 2,500 people, on three shifts, and is scheduled to produce 2,000,000 tyres a year. It will go into production in 1960. The output in terms of materials used will, it is understood, approximate that of Fort Dunlop, which indicates that a considerable proportion of the tyres to be produced will be of the larger sizes such as tractor and earthmover types.

The factory has been laid out and will be equipped according to specifications drawn up and recommended by Dunlop Advisory Services Ltd., a subsidiary of the Dunlop Rubber Co. Ltd., which is acting as consultants to the consortium.



A model of the Russian tyre factory designed by Dunlop Advisory Service Ltd.

The layout has been arranged to give continuous and directional flow of work through the various operations and is highly mechanized, giving a high degree of automaticity. In addition, suitable tyre test machinery is being provided for routine and development testing, together with equipment for suitably furnishing the various control laboratories.

Manufacturing Machinery

The mill room section housing the automatic powder handling system occupies three floors, the remainder of the building varying in height according to the demands of the processes.

Carbon black and other powders stored in the raw materials building are conveyed to the point of usage and discharged into storage hoppers above the mixers, to which various oils are also piped. Powders and oils are automatically weighed with extreme accuracy to pre-determine formulae interpreted by Powers Samas punched cards which are inserted into card readers and control these ingredients for various mixings as specified.

Thirteen mixers are to be installed. Of these four are large mixers driven by 1,500 h.p. synchronous electric motors, and nine by 1,000 h.p. motors of the same type.

An extensive overhead conveyor system conveys the bales of the various rubbers from the stores building into the mill room and deposits them in a position for the required processing. In cold weather frozen bales will be automatically passed through di-electrically heated ovens to thaw such rubbers and bring them to the desired temperature for processing. These rubbers are subsequently pelletized by automatic delivery to pelletizers where the raw and mixed rubber pellets are pneumatically conveyed to storage hoppers and weighed out in the correct sequence as determined by the card system.

Continuous processing of the various rubber mixtures is provided for by a series of strip conveyors which deliver the hot, mixed rubber from roller mills for distribution to the calender tread or tube extruders.

For the treatment of the various fabrics, including nylon, two large fabric dipping, drying and tensioning units are arranged in line with the respective rubber calenders, the whole system being automatically controlled both as regards conditions for the proper treatment of the fabrics together with that of controlling the rubber film thickness that is deposited on the fabric by the calenders.

The rolls of fabric are conveyed to the bias cutters, after which they are continuously joined and arranged in storage conveyors for distribution to the various tyre building machines.

The treads, with the exception of the very large sizes, are also conveyed automatically on arrival at the tyre building machines according to demand. Other component parts of the tyre are also conveyed to their particular tyre building machines.

After completion of the uncured tyre at a tyre building machine, the tyre is conveyed and automatically delivered to the inspection point, following which it is painted and automatically picked up for delivery to the vulcanizers.

Vulcanization

The vulcanizers for all sizes up to and including the largest sizes in the truck range are all vulcanized in Bag-O-Matic presses of which there are 242. These include 50in., 75in. and six 120in. presses.

The uncured tyres, as previously mentioned, are delivered and automatically dropped above the presses on to feed conveyors as and when a particular press requires a definite size of tyre. The whole operation of

discharging from the feed conveyors to the press, together with the operations prior to closing the press, are all automatically controlled by electrically driven timing apparatus.

Such timers also allow for the supply of steam, high pressure, hot water and other services to the diaphragm within the press and following the complete vulcanizing process and the reversal of the services within the diaphragm, the press is automatically opened and the tyre ejected through the rear of the press and conveyed to the finishing section.

Production Control

A control system is being provided which will automatically record the production of the various codes of mixings, types of fabric, tyres and tubes produced, such recording being provided by electric signals wired to the production control room where the printers punch out the required information on to tape feeding the automatic typewriters which record the production figures each hour and give the totals of such production at the end of each shift.

Tyres on arrival in the finishing section are conveyed through the several operations of inspection, painting, balancing and finally conveyed to the finished goods store for assembly and despatch.

Situated alongside the manufacturing block is an administrative office building, while on the outside of the main manufacturing building are service buildings housing air compressors, water pumps, main electrical switchgear, tyre test house, research laboratory and maintenance machine shop. All the buildings are of precast, reinforced concrete construction.

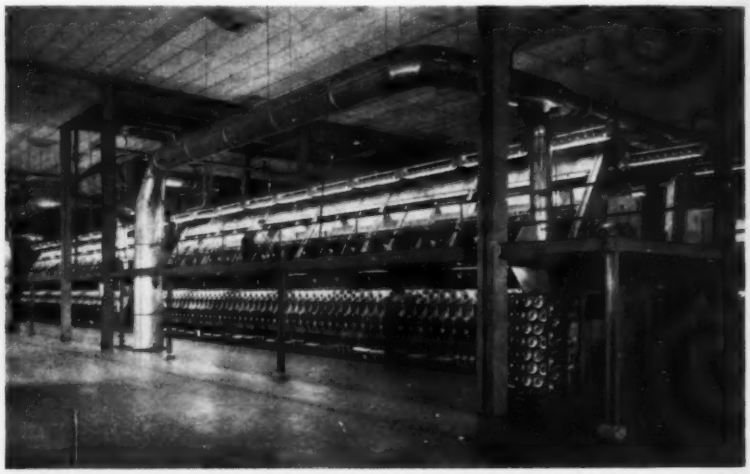
A separate building, having a total floor area of 326,000 sq. ft. to one side of the main manufacturing building, is arranged to accommodate the necessary stocks of raw materials at one end and the finished goods at the other. Raw materials, *i.e.*, powders and raw rubber, will be carried on post pallets, and adjacent to this building are concrete silos provided for the reception and storage of the various carbon blacks.

Kuala Kubu Rubber

The name of the Kuala Kubu Rubber Estate Ltd. has been changed to Broadweir and Southern Properties Ltd., and a proposal has been approved whereby the capital will be increased to £500,000 by the creation of 2m. unclassified 2s. shares and 250,000 unclassified £1 shares.

Russian Contract For Courtaulds

MAJOR contracts worth some £15m. between a Courtaulds subsidiary, Prinex Ltd., and the Soviet Union have been announced. These provide for the supply of complete plans and technical processes for the manufacture of viscose rayon tyre cord, acrylic staple fibre and cellulose acetate yarn. Delivery of the Courtaulds equipment for the new plant will start in about 12 months, and final completion is to take place by August 31 1961. Courtaulds is to supervise erection of the equipment. A substantial part of the machinery will be constructed at the company's Coventry works, but some will be sub-contracted. (Courtaulds is also supplying machinery for a cellulose acetate plant as the result of a contract concluded last year.)



Part of a machine, at the Coventry factory of Courtaulds Ltd., producing 'Tyrex.' The machine spins, chemically treats, washes and dries the yarn, and finally winds it on to bobbins

This contract was concluded between Prinex — a wholly-owned subsidiary of Courtaulds, which was formed earlier this year to negotiate overseas contracts—and the Soviet state importing agency V/O Techmashimport, which specializes in imports of machinery and equipment. Mr. Klentsov, head of Techmashimport, was in the UK earlier in the month, and met leading industrialists.

Tyrex

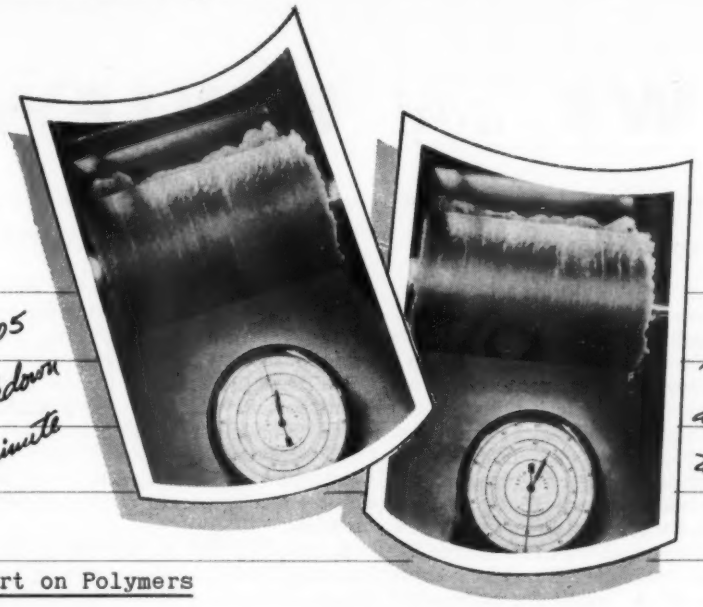
Intensive research into, and development of, high tenacity rayons is being conducted by Courtaulds Ltd. at its Coventry plant. The company has played a leading part in the development of rayons and it is having considerable success with an improved version of the 'Tenasco' rayon; this is called 'Tyrex.' It has a number of applications but the main one is in the manufacture of tyres.

'Tyrex' represents, according to the company, a break through in fibre physics and chemistry, the physical characteristics of the fibre having been modified to give improved properties as regards dry and wet strength, dimensional stability, toughness, etc. Exhaustive tests have been conducted on this material, which has a breaking strength of 35 lb., and in direct test competition with its nearest competitor, nylon, it has shown itself to be considerably more effective as a reinforcing agent.

Glass Fibre Aerials

With glass fibre, Smiths Radiomobile have produced a low cost car radio aerial which can be obtained in varying lengths and in a range of colours. It has a copper core with electrical contact made direct to the aerial lead. Masts of up to 96in. have been supplied.

The masts are manufactured by Semtex Ltd. at their South Wales factory, from Duraglas Rovings supplied by Turner Brothers Asbestos Co. Ltd. Final assembly and the manufacture of the basis and aerial leads is by KLG Special Products Division, part of the Smiths organization.



Report on Polymers

ASRC POLYMER 3105 ELIMINATES
BREAKDOWN STEP IN PROCESSING

Photographs above show how ASRC 3105 gives head start over competitive polymer 1502 in processing. Rubber and fillers can be introduced simultaneously without breakdown time before mix — with considerable savings in processing time and reduced power costs.

ASRC also offers additional advantages --

1. Absorbs 20-30% more fillers
2. Can be used as softener with other polymers to improve processing of compound
3. Less shrinkage — with high tensile and good tear resistance in sponge rubber
4. Compatible with various resins and plastics
5. Best color available in polymers

Test samples and literature on ASRC 3105 available on request.

For highest quality synthetic rubber...efficient service timed to your needs...personal attention to your orders ...prompt shipments — call your ASRC distributor.

AMERICAN SYNTHETIC RUBBER CORPORATION

Sales Agent for United Kingdom and Ireland.
Anchor Chemical Company, Limited, Clayton, Manchester 11
Sales Agents in Rubber-Consuming Countries throughout the World

500 Fifth Avenue, New York 36, N. Y., U. S. A.
Plant and General Offices: Louisville, Kentucky, U. S. A.

Cable: AMSYNRUB NEWYORK

VIEWS and REVIEWS

Cord Properties

ACCORDING to W. S. Symes (British Nylon Spinners Ltd.) in the 'Prediction of Cord Properties' (*J. Textile Inst. Transactions*, 1959, 50, T 241) continuous-filament nylon yarns are becoming more widely used in tyre cords, fishing nets and other products where breaking load and extension at break are important properties. Another matter of importance is that the shrinkage of cords exposed to heat is of interest when cords are cured in rubber. These properties of cord are, says the author, 'clearly properties of yarn and the aim here *(i.e., in the paper quoted)* is to discover the forms of these functions.'

The author has developed formulae to predict the breaking load of cord, and its contraction on heating, from cord tex and from the properties of the constituent continuous filament yarn.

Experimental

In exemplification of the experimental work, it may be mentioned that (p. 247) there are graphs showing: (Fig. 5) a Comparison of Theoretical and Experimental Breaking Loads plotted against cord tex, and ditto for *Extension at Break* (Fig. 6) also plotted against cord tex. Fig. 7 shows Contraction of Cord on Heating as a function of cord tex, and Fig. 8 represents Contraction of Cord on Heating as a function of Contraction of Yarn on Heating. Figs. 7 and 8, it should be added, as well as 5 and 6, compare experimental results with theory. The mathematical development of the theoretical figures can be read in detail in the paper.

In the April 18 issue of *RJIP*, under the heading 'Notes,' I made reference to the Fort Dunlop suggestions scheme. The best individual suggestion of the year 1956, as I said, was that of Mr Harry Hobson, to cure the trouble of the trapping of cycle cover air bag bases during the moulding operation. His idea of fitting lugs into the mould was an essentially simple one, as illustrated, but it solved the problem and earned for Mr Hobson the company's 'Yeoman's Cup'

Discussion

In the introductory summary, the view is expressed that theory and experiment agree well for breaking load of nylon cord and its contraction on heating, but that 'the agreement is poor for extension at break.' Moreover, 'The theory does not assume any particular form of cord geometry.'

In the final 'discussion' the author remarks that a limitation is implied by the finding that differences exist between the yarn properties before and after making into cord, but that the cord-making process is probably at fault rather than the theory. In this connexion it is stated that the cords were made on a laboratory single-spindle downtwister, and it is not known whether improved results could be obtained on another machine. The theory has been tested only with nylon cords, and it is considered possible that agreement might not be so good with other materials.

Scrutinizing the graphs one is inclined to feel that, excepting, perhaps, the extension at break figures (Fig. 6), agreement between theory and experiment is, to put it from the point of view of a non-expert, 'not too bad.' More especially to the said non-expert it does appear that, throughout, the arrangement of the theoretical points is practically linear, and, in this regard the author's suggestion that the theory developed in a paper by L. R. G. Treloar entitled 'The Geometry of Multiple Yarns' (*loc. cit.* 1956, 47, T. 348) might be linked up with the present (*i.e.* Symes') theory to find breaking load, EB, or contraction on heating cords.

Plastics Names Abbreviations

The Editorial in the February 1959 issue of *Modern Plastics* (p. 230) relates to 'Alphabetical Abbreviation for Plastics and Resins.'

At a first glance you might not think that there would be any direct practical connexion between plastics and vitamins, but the Editor of *Modern Plastics* has answered this problem readily and neatly. He says:

'If the vitamin industry had not turned to alphabetic abbreviations two decades ago, it is doubtful whether public acceptance and understanding of vitamin products would have been so rapid, and sales so vigorous.'

'Plastics,' Mr McCann continues, 'have names that are quite as resonantly complicated as those of the vitamins, and hence the necessity for some sort of simplification and abbreviation.'

Action by ASTM

MP draws attention to the fact that Committee D-20 of ASTM has put forward to the Society (and has had accepted) a list of alphabetical abbreviations relating to plastics and resins, as well as of plastic and resin additives. The abbreviations 'established to date' then follow in our contemporary's leader. These number about 30. Examples: Cellulose acetate=CA; Polyacrylonitrile=PAN; Polyethylene=PE, etc. So far there appears to be only one material called by name, namely: Polyamides (synthetic)=Nylon, and Poly(hexamethylene adipamide)=Nylon 66.

However, *MP* suggests that, now that such a good start has been made, the process can be continued as and when the need arises. For example, Polyester resin might appear as PY and reinforced plastics could be abbreviated to RP. A useful suggestion on the part of *Modern Plastics* is that abbreviations used in a publication for the first time should be enclosed in parentheses and preceded by the written word or words being abbreviated. Subsequent

COMMENT ON SCIENTIFIC AND INDUSTRIAL MATTERS

by **DR SCHIDROWITZ**

references to the plastics in an article can then be by the appropriate abbreviation only.

(*Note:* Carrying out a well-known example closing the gap between theory and practice, *MP's* cover in the February issue is described (*as showing*) 'Handsomely-styled housing, being installed on outboard motor of reinforced plastics in a plant of advanced design. The full story is told in our lead article "New mass-production plant for RP moulding," p. 87. Colour photo courtesy Outboard Marine Corp.')

Man-Made + Animal Fibres

In the *Proceedings* of the *Journal of the Textile Institute* for March 1959 (vol. 50, No. 3, p. 128) there is reproduced a lecture given before the Yorkshire Section of the Institute (19.11.57), on 'The Production of Yarns from Blends of Man-Made and Animal Fibres' by W. Hardacre.

In this paper, in addition to matters of technical import, there is an interesting flavour of historical interest.

The author goes back to 1934/5 when Courtauld's set up an experimental worsted plant . . . to investigate the processing of man-made fibres alone and blended with the natural fibres. At that time only viscose staple and acetate staple were available.

On January 30 1936 Mr Hardacre introduced the subject (*of processing man-mades by means of worsted-type equipment on a commercial basis*) to the Yorkshire Section of the Institute, and 'This was, in fact, the first paper given in Bradford on the topic, and optimism was the keynote of the lecture.' Then the lecturer proceeds:

'In spite of trials and problems, optimism still prevails and it is most appropriate that we should review the progress over 21 years and give some thought to the future.' I strongly recommend this review for reading, but here, I can only give (1) a few of the figures (as extracted from Table 1) and, (2) some outline particulars of the 'latest addition to commercial fibres.'

With regard to (1)

WORLD PRODUCTION IN MILLIONS OF LB.

Fibre Type	1936	1956/7	Percentage Increase in 21 Years
Man-made Fibres—Staple			
Viscose and acetate..	298	6,881 (a)	2,209
Other synthetics ..	—	992 (a)	—
Total ..	298	7,873 (a)	2,542
Raw Wool			
Greasy basis ..	3,804	4,965 (b)	31
Clean scoured basis	2,070 (c)	2,830 (b)	37

NOTE.—(a)=Planned capacity; (b)=Estimated production; (c)=Average 1934-35 to 1938-39; (d) All data from C.E.C. publication 'Industrial Fibres.'

Courtelle

Sub-heading 5 (p. 138) relates to Courtelle/Wool Blended Yarns, and this covers some interesting information re Courtelle (*which*) is the latest addition to commercial fibres classified as the acrylics. 'It is added that Acrylan and Orlon belong to the same family.'

The author states that 'the outstanding properties of Courtelle are its bulk, soft handle, high resistance to sunlight and to attack by moths, mildew and bacteria, ease of laundering and, in the standard form, stability of shape.' In general, Mr Hardacre remarks, the physical properties of the fibre are in the medium range, and 'are therefore suitable for most textile purposes.'

An ingenious application, which seems to me to be of particular interest, makes use of the fact that Courtelle fibres can be produced which show a high shrinkage on immersion in boiling water. If a suitable blend of these high-shrinkage fibres with standard fibres is made with a correct balance of twist, on immersion in boiling water (*i.e.* 'the dyebath') the former fibres contract and cause the staple fibres to pucker, 'so producing the effect of high bulk.'

For a comparatively short paper, this communication covers much detail in seven tables and 15 Figs. In this regard, the following paragraph (p. 138) gives useful and practical information, as it seems to me:

'There is probably more accumulated experience in the worsted trade in the processing of Fibro/wool yarns than in any other man-made fibre in blend with wool. In view of this, the comments on the processing of Courtelle/wool blends and the evaluation of the properties of the yarns produced are considered in relation to Fibro/wool mixture yarns.'

Dr F. H. Carr

In an issue of *Chemistry and Industry* (March 14 1959) the Society of Chemical Industry announces that the Society's medal for 1959 has been awarded to Dr Francis H. Carr, C.B.E., who will be presented with the Medal during the annual meeting of the Society in Glasgow in July next. Dr Carr's address will be entitled 'Autonomy and Automation in Chemical Industry.'

To this announcement I may be permitted to mention that I have been acquainted with Dr Carr for something like 50 years. We were both very young men at the time, and if I remember rightly Dr Carr was kind enough to take some notice of a paper published in the *Journal of the Society of Chemical Industry* connected with the viscosity of rubber and rubber solutions, by the author of this note and H. A. Goldsbrough. I feel sure that Dr Carr's address will be of more than ordinary interest. His place in Chemical Industry and Science should be a landmark.

Kautschuk und Gummi

The January issue of *Kautschuk und Gummi* contains a number of interesting articles (1959; year 12) together with summaries in English and French.

In the section on *Science and Technology* there are abstracts in English and French on (a) *The Vulcanization of High-Elastic Polymers* (Communication No. 23 in this series) dealing specifically with 'The Kinetics of Vulcanization Reactions and the Physico-Mechanical Properties of Vulcanizates.' This series is by Walter Scheele and Karl-Heinz Hillmer.

(b) The second of the abstracts on *Science and Technology* was by B. A. Dogadkin of Moscow, on the 'Vulcanizate Structures and Their Alteration during Vulcanization, Thermo-mechanical Effect and Fatigue.'

(c) A further interesting abstract relates to 'The Significance of Free Radicals for the Reinforcing Process' by J. W. Watson and R. Jervis, of Birmingham. This abstract deals largely with active carbon blacks and the reinforcing effect.

Other sections of Kautschuk relate to Economy and industrial and social matters.

Those able to do so will wish to read the papers referred to in the original.

PHILIP SCHIDROWITZ

Questions Corner—71

(Second Series)

303. What are the advantages of using silicone finishes for protective coatings?

304. What are the essential parts of an injection moulding machine?

305. What different types of extrusion methods are used in the plastics industry?

306. The Standards of the American Institute of Electrical Engineers provide for a classification of insulating materials. What is this classification? Why are silicones used for insulants?

(Answers next week)

Answers to Questions Corner—70

299. There are several reactions which may occur when polyvinyl chloride is subjected to the action of heat and light.

First of all either heat or light may give rise to the formation of hydrogen chloride and this free chloride may, by catalytic action, produce further breakdown of the polymer. As a result of the liberation of the hydrogen chloride, double bonds are formed producing points at which the long chains may break down to form shorter ones: $-CH_2-CHCl-CH=CH-CH_2-CHCl-$. At the double bonds oxidation may occur resulting in cross-linking of the polymer. This is evidenced, in many cases, by discoloration and embrittlement. This embrittlement may be accelerated by the action of ultra-violet light on the double bond structure. Finally, free radicals may be formed which, because of their high reactivity, may propagate chain reactions.

As degradation progresses as the result of oxidation at the double bonds, carbonyl groups are formed which contribute to the intensification of the colour produced. On further degradation, probably cyclization and chain cross-linking takes place with simultaneous or subsequent dehydrogenation, giving rise to carbonization.

300. To minimize any reactions that may occur due to the degradation of polyvinyl chloride a class of materials, known as stabilizers, is added to the compounds. A stabilizer may be defined as any material which, when added to the resin, will prevent or retard the activity of reactions likely to occur resulting in the degradation of the resin.

An ideal stabilizer should be: a. Capable of removing the hydrogen chloride in the form of insoluble products; b. capable of inhibiting any reactions initiated by the passage of ultra-violet light; c. capable of acting as a selective ultra-violet absorber; d. capable of breaking up colour producing polyene systems; e. capable of acting as an anti-oxidant; f. should not leach out in water; g. should be tasteless, odourless and non-toxic when the products in which it is used are likely to come in contact with foodstuffs.

There is no one stabilizer, so far, that adequately fulfils all these requirements and present practice is to use two stabilizers to meet the particular service conditions required by the final product.

301. Silicone release agents are used in the plastics industry for all types of moulded products because they combine some or all of the following advantages: When applied to moulds, etc., they do not carbonize or decompose to produce gases or build-up by-products on the mould face. They do not chemically react with other materials used in processing. Silicones cover large areas quickly and evenly and penetrate into small cavities, whether due to wear or design, in the mould. They act as lubricants between many types of surfaces. They are easy to apply whether by spraying, wiping, dipping, brushing, etc., and are economically used as water emulsions.

Sometimes, however, it is not desirable to use water emulsions either because the presence of water in a system is not desirable, or because a thicker film of silicone is required on the surface of the mould than could be applied from a water emulsion. In such cases solvent solutions, or 100% silicone release agent, may be applied. Solutions are desirable when used on cold moulds.

The degree of permanence on the mould surface is governed by the particular application. When, for example, it is being used on a surface from which it is removed by each moulding then obviously the surface of the mould will have to be treated after each article has been removed.

302. First of all there is the process known as the 'Wet Process' for the manufacture of hardboard and this consists essentially of preparing the wood chips into fibres of predetermined length and size by grinding methods. These are then washed, refined, screened and fed to a machine which is similar in type to a standard paper making machine, where the board is formed as a thick continuous mat. This 'wet lap' is then trimmed and cut to size and the pieces placed on screens and inserted between platens of a press, heated under pressure for varying periods of time for curing. The water is removed during this part of the process or the mat may be first pre-pressed to remove the majority of the water, or sent through a drier. This reduces the press cycle.

The 'Binder' process refers to the use of synthetic resins, glues, etc., with wood waste to form hardboard. Three types of process may be used: a. The dry resin, or other binder, is mixed with dry wood fibre, the moisture content of the wood being somewhat less than 15%; b. liquid resin is used with relatively dry wood fibre (less than 5% moisture); c. liquid resins are added to a wet slurry of the wood fibre.

Where hardwood is more readily available than softwood the binder may be mixed with the wood fibre in a dry state. The density of the panels, however, made with the latter is higher than with board made from the former. The process consists in grinding the wood waste to a uniform size, reducing the moisture content to less than 10%, mixing with the binder, laying up the mixture on trays and then curing under heat and pressure.

(More questions next week)

Latex Final

We are indebted to Mr Hevea do Brasil, one of Miss Polly Ester's most faithful admirers, for the following:

Sam took his harp to the Cup Final,
But nobody asked him to twang it.
Then a band played the Hymn Twenty-seven,
And the great crowd all stood up and sang it.
Sam thought of his latex foam cushions,
Which would rest his poor tender spots,
Where people had jostled and bumped him,
When Luton got tied up in Notts.

For delayed action accelerators—

Monsanto

See Monsanto first!

Monsanto has the chemicals you need . . .

SANTOCURE · SANTOCURE NS · SANTOCURE MOR

In addition to the above products Monsanto's range of accelerators includes:

Aldehyde amines, thiazoles, guanidines, thiurams and dithiocarbamates.

Monsanto works constantly to develop new, better chemicals for rubber—as well as to improve those you already use.

Santocure is a Registered Trade Mark

Monsanto chemicals help industry – to bring a better future closer

Monsanto

Reg'd.

MONSANTO CHEMICALS LIMITED

579 Monsanto House, Victoria Street, London, S.W.1, and at Royal Exchange, Manchester, 2.

In association with: Monsanto Chemical Company, St. Louis, U.S.A. Monsanto Canada Ltd., Montreal. Monsanto Chemicals (Australia) Ltd., Melbourne. Monsanto Chemicals of India Private Ltd., Bombay. Representatives in the world's principal cities.

MEN and MATTERS

A Review of People and Events

by George A. Greenwood

ONE of the most interesting items of the week's news is that, other things being equal, Mr T. H. Miller has this weekend (which means yesterday), succeeded to the chairmanship of the Rubber Growers' Association, and Mr W. Anderson to the vice-chairmanship. They were chosen for these respective positions two or three weeks ago, and surely no choice could have been better.

Mr Thomas Henry Miller has had a life time in the rubber industry and he is widely known in England and abroad as a director of R. G. Shaw and Co. Ltd., of Shaw, Darby and Co. Ltd., Oriental Estates Agency, Leadenhall Nominees, and several other companies. A Londoner, in his fifties, he has been a member of the Council of the RGA since 1951 and he has also served for many years on the Malaya Committee, the Commercial Research Committee and the Technical Committee of the Association. Mr Miller is not given to publicity, but I can say that he is married with a family of three children (two sons and a daughter), and that apart from his commercial and family life he confesses to no other special interests or pursuits—not even golf!

Mr Anderson, a Scot, also in his fifties, has been associated with the rubber industry for well over three decades, both upon the growing and the commercial sides. I am told that he has been connected with Edward Boustead and Co. Ltd., so well known in South-East Asia, as well as in the City, for over 35 years—indeed I believe the whole of his working life has been spent in its service. Mr Anderson is now a Man of Kent—or a Kentishman, I am not quite sure which—and is married, but with no family. He used to be a very keen golfer, almost a scratch player, but his friends tell me that he is not as keen as all that nowadays.

The Big Bounce

I cannot forbear to say a word or two about the near elation which has been felt in rubber trade circles, not only in London, I suppose, but much farther afield, in the spectacular rise in the price of raw rubber during the past few weeks. It has certainly given company directors sufficient encouragement to look a second time at the early casting of their balance sheets, and has probably accounted for some of the welcome increases in dividends. I see that one of my contemporaries described this new situation the other day under the heading 'The Big Bounce,' and of course it was on that particular day, because the price had soared to 2s. 5½d., that being the highest for two years. Even with the inevitable reaction it was 2s. 4⅝d. a day or two later, and as I am writing there seems little doubt about the fact that it is going to be held more or less round about this figure for some time. Presumably, the explanation given that the substantial and persistent advance has been due to big purchases in Singapore, in prospect of a production shortage, is a good one, but perhaps the most obvious explanation is the continued interest of buying from Russia.

An Interesting Board Change

Amalgamated Brewas Rubber Estates announced last Saturday that Mr A. R. Scott had been invited to join the board, as from that day. He succeeds Mr J. A. Loram, who has resigned as a director. Both men are among the best-known figures in the rubber industry and both are, of course, jointly associated with other companies. Mr Loram is chairman and managing director of Dickson Anning and Co. Ltd. of Candlewick House, Cannon Street, and Mr Scott, who is a chartered accountant, with headquarters in the same building, is on the Council of the Rubber Growers' Association—or was.

More Developments

An interesting and significant example of how plastics is spreading its wings still so that they touch many other industries is provided by this week's announcement that one of the great Scottish organizations, John G. Stein and Co. Ltd., with its capital of £2,500,000, has been turned into a public company, and that an issue of £1,000,000 in 7% cumulative preference shares of £1 each at 27s. 6d. per share has been made. This old family undertaking was started in 1887 by Mr John G. Stein, grandfather of the present chairman, Mr Colin Hunter Stein of Stirling, to manufacture firebricks, ground fireclay, and ganister, etc.

In the course of the years, however, and particularly in more recent years, it has added to its products refractory cements, and plastics and castables for furnace linings, and it has developed a wide market both at home and abroad, a very great change indeed from the days when 'John G.' started operations over 70 years ago. The record of this undertaking over the years is sufficiently impressive, I should imagine, to ensure the success of its new financial developments, but it is particularly with this notable, and perhaps not so well-known addition to its products that we of *RJIP* are particularly concerned.

But, as I keep on saying, the new and varied, and often spectacular uses of plastics becomes endless. This week we have been entertaining that young and glamorous monarch, the Shah of Persia, upon a State visit to Britain, and London has been bedecked. Right along the Mall, approaching Buckingham Palace, there were put up 50 plastic crowns, alternately the Queen's and the Shah's, mounted on poles. They cost £12 apiece! They were dignified affairs. Ministry of Works draughtsmen designed the red and yellow-plumed Shah's crown from the description given to them by the Irani Embassy, and a synthetic fibre plume was so made that it stayed erect in the wettest weather.

Life Vice-President

IRI ELECT DR SCHIDROWITZ

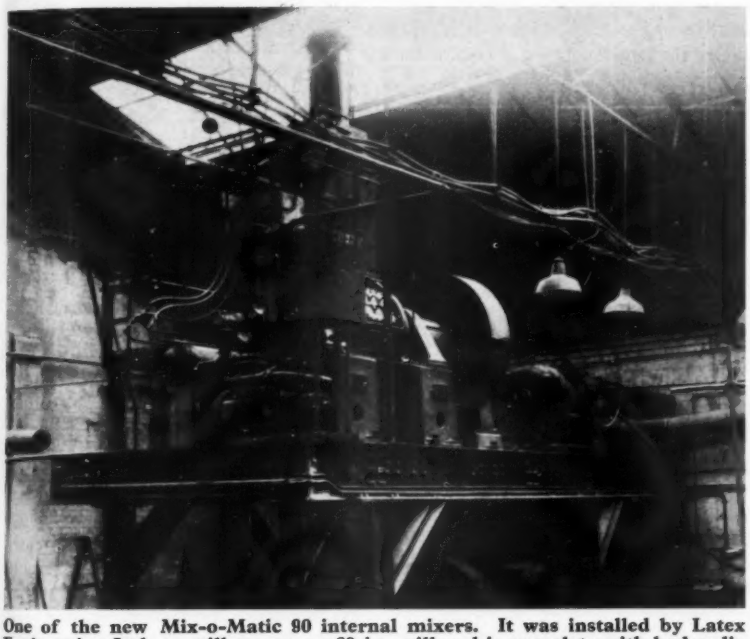
AT a meeting of the council of the Institution of the Rubber Industry, held in London on April 28, Dr Philip Schidrowitz was unanimously elected the first life vice-president of the Institution in recognition of his outstanding services to the Institution through the years.

Dr Schidrowitz has contributed his 'Views and Reviews' to *RJIP* for 39 years. He has achieved world-wide fame within the rubber industry for his contribution to the science and technology of rubber.

New Internal Mixer

FOR RUBBER AND PLASTICS

A NEW internal mixer, the 'Mix-o-Matic 90,' designed for improved performance and easier maintenance, is being produced by the Latex Engineering Co. Ltd., 15 Bishop's Bridge Road, London, W.2. While to all outward appearances the machine is of the orthodox type, it incorporates a number of interesting features.



One of the new Mix-o-Matic 90 internal mixers. It was installed by Latex Engineering Ltd. on stillage over a 60-in. mill and is complete with hydraulic pump for slide operation, booster cooling water pump and discharge chute

The rotors are of the interlocking type, stellite tipped, with renewable wearing plates in the body ends. The dust glands are of the split housing type, securely sealed, and provision has been made for easy replacement of the packings. The rotors are mounted on roller bearings, fitted into steel housings and securely sealed against ingress of dust, independent from the body of the machine.

The steam and water connexions for the rotors are of an improved type fitted with renewable packings, and the body is arranged for steam or water cooling with full size sectional covers for inspection and easy cleaning of core chambers. The throat cylinder has a large diameter piston to ensure efficient mixing of the stock, and lubrication is by mechanical grease pump to all revolving parts and each line is fitted with an inspection tell-tale.

The machine is fitted with a two-speed gear box for rubber or plastics and provided with automatic cycle control and temperature recorder. The pressing of a push button closes the air-operated loading chamber door, which is interlocked with the discharge slide control and so arranged that it remains in the closed position until the slide is returned to exact working position when the loading chamber door automatically opens, for reloading. The sequence can also be manually controlled.

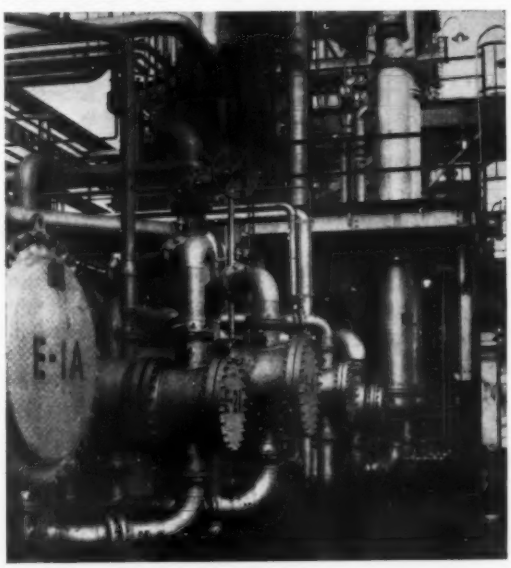
Machine Hire Scheme

A SCHEME by which a variety of machines—including those for the manufacture of plastics, etc. —can be hired, without deposit or capital expenditure, has been introduced by F. J. Edwards Ltd., 359-361 Euston Road, London, N.W.1. The machine is delivered on the signing of the contract and on receipt of the first monthly hire charge.

The minimum period of rental is three years with the option of a new agreement for another machine or continuance of the old contract on the same machine at advantageous terms. Payment of the first monthly hire charge, £31 18s. 11d., ensures the immediate delivery of a £1,000 machine. Similarly, £16 7s. 10d. ensures delivery of a £500 machine, and £3 7s. 3d. a £100 machine; followed by 35 equal monthly payments.

The hiring charges are deductable in full from profits, thus saving income tax of 7s. 9d. in every £1. So the total cost of hiring a £1,000 machine would only be £704 7s. 6d. over three years. This is a net cost of £4 10s. 4d. per week or 2s. 3d. per hour, based on a 40-hour week. For a further three year contract with the same machine, the rental would be £2 13s. 3d. per month or a net cost of 2¼d. per hour for the second three years.

An explanatory leaflet is available from the company explaining in detail this unique machine hire plan, which is available for the whole of Great Britain and Northern Ireland.



Ebonite-lined pipes manufactured by the Silvertown Rubber Co. Ltd., Vincent Square, London, S.W., a member of the BTR group, are being used on the salt water coolers of the Esso Chemical Plant at Fawley

Corrosion Exhibition

INCREASING ROLE OF PLASTICS

AN indication of the serious interest which is being taken in corrosion problems is given by the attendance figures of the Corrosion Exhibition which was held at the New Horticultural Hall, Westminster, London, on April 27-30. Some 10,000 people visited the exhibition, in which plastics were well represented. A general impression gained from the exhibition is that plastics materials are being used more widely to combat corrosion than they have been before. Rubber was also represented—there were some interesting exhibits showing what progress is being made in the field of lining intricate structures with rubber —but generally there were not many rubber products on show.

The largest exhibit was that of the Anglo-American Synco Corporation (a member of the BTR Group). The company's stand was dominated by a casting (8)* which had been lined internally with synthetic rubber. Nordac Ltd., showed an example of a rubber lined tank (17), and Dunlop (4) showed an example of the size of moulding which can be made from rubber.

Protective Rubber Coatings (Bristol) Ltd. displayed a bilge pump (22) of bronze which had been coated with 'Limpetite' synthetic rubber, again illustrating the complicated type of structure which can be satisfactorily coated.

Resin-Bonded Glass Fibres

Resin-bonded glass fibres are playing an increasing part in the fight against corrosion and, as expected, a number of examples of this material was shown. Ciba (ARL) Ltd., showed a centrifugally cast 'Araldite' epoxite resin tube and a valve (7) made entirely from this resin. An illustration of the use of glass fibre reinforced tissue for covering pipelines was given on the stand of Fibreglass Ltd. (16), and the glass fibre tray (21) on the stand of A. E. Griffiths Ltd. was particularly interesting as these trays to date have been made of a thermoplastic material. On the same stand a large roof ventilator (9) including a fan unit gave some idea of the size of product that can be made in resin-bonded glass fibre. Fibreglass Ltd. showed a glass fibre reinforced chemical tank designed to operate at a temperature limit of 120°C. considerably higher than could be done with thermoplastics (13).

On the stand of the Plastics Engineering Sales Division of K. W. Chemicals Ltd. was shown a new type of epoxy resin bonded glass fibre tubing incorporating 'Y' pieces, etc. (6). This tube which is made by a new patented process apparently gives greater strength to the pipe and reduces the possibility of bubbles in the finished product which can cause serious problems in a number of instances. Plastic Constructions Ltd. showed HD Polythene fabrications, and amongst their exhibits was a 14in. fan (11).

Ducting Extraction Fan

K. W. Chemicals Plastics Engineering Sales Division had a working example (10) of a 500 cfm 10in. fan, a new product for them, so designed to fit straight into a ducting extraction system without involving directional change, this being in direct contrast to the standard unit (18) also shown. On the right of this illustration is a working example of a new portable pump with all moving parts in plastic, which uses the acid in which it is placed for lubricating the bearing surfaces, the unit shown handling 150 gallons per hour.

In the field of thermoplastic tubing, H. Incledon and Co. showed a wide display of both fittings and tubings in PVC high impact PVC HD polythene and nylon. The diameter of tubing made as well as the necessary 'T' pieces and couplers was shown (2). On the Shell stand there was a particularly interesting display of PVC tubing made by Wavin of Holland, showing their special saddle clamp for introducing branch lines one of which is illustrated in the bottom left-hand corner of illustration 5.

F. Hayworth (ARC) Ltd. showed a plastic tank with a very useful ball valve incorporated (20). This again being entirely made from thermoplastic materials. Prodorite Ltd. did not have a great deal on show in the field of thermoplastics, but one item of particular interest was a fabricated poythene tank with a flue pipe welded in (12).

Again it was interesting to notice on the stand of Doulton's that amongst all the stoneware on display was a filter unit in which the casing had been made of rigid PVC in order to combat the corrosive effects which sometimes occur (14). In the field of large-scale structures BX Plastics Ltd. had a considerable number of items on display made from their thermoplastic materials. A particularly intricate structure being lip extractor unit (15). This being mainly used in the plating industry, where, of course, corrosion is extremely severe.

Returning to the stand of A. E. Griffiths Ltd. there was displayed a very large fume extraction hood assembly (1) which is designed specially for use with the Albright and Wilson 'Phosbrite' process; again this illustrates the size of plant that can be made from PVC.

In the field of thermoplastic coatings a very wide display of items was shown on the stand of Durable Plastics Ltd. The varied and complicated type of structure that can apparently be successfully coated to considerable thicknesses with polythene, thereby giving good resistance against salt water or chemical corrosion was illustrated (3). On the BTR stand examples of pipe work in high-impact PVC and vulcanite were shown. In the illustration (19) are a vulcanite-lined pump, a flanged length of high-impact PVC and flexible PVC for joining acid resisting brickwork.

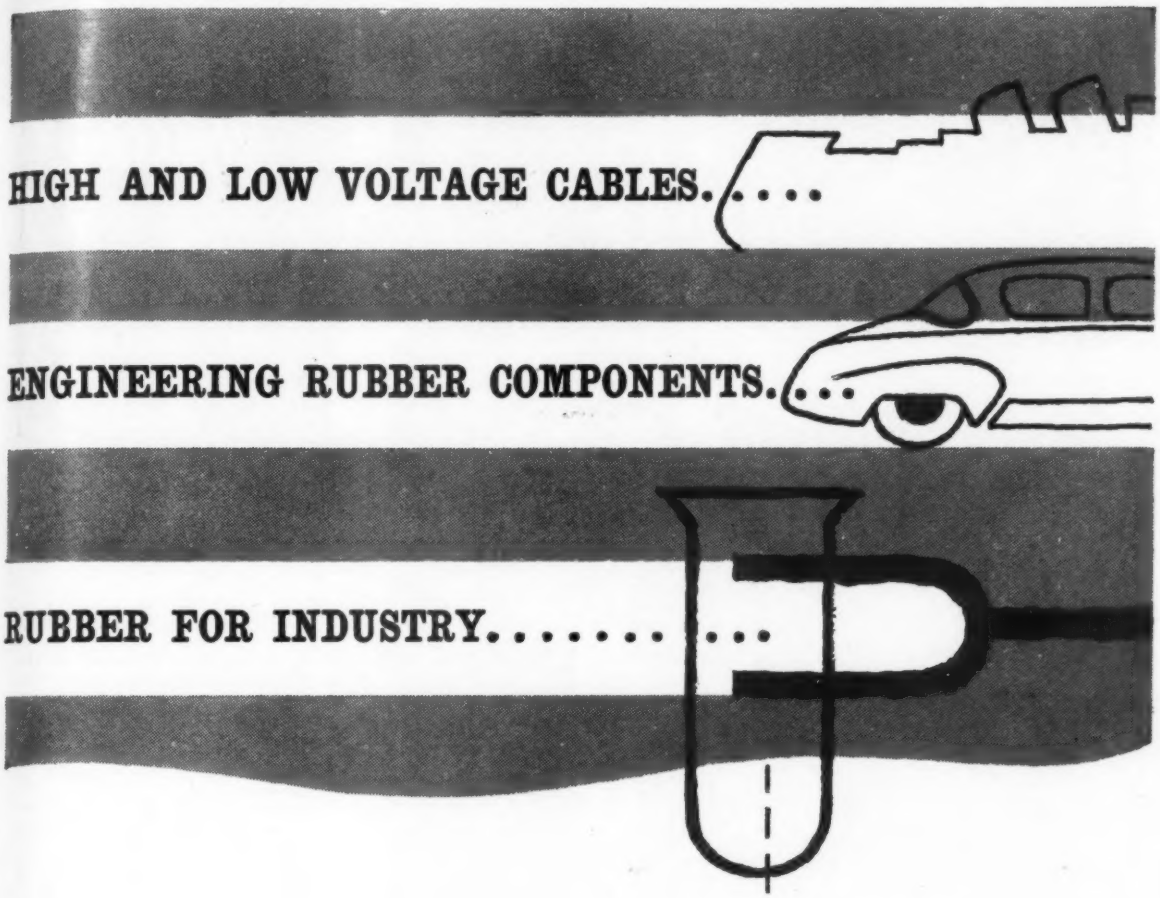
Summary

To summarize it is reasonable to say that this exhibition was of real technical interest to chemists and engineers and certainly the use of thermoplastics in their various forms were well illustrated. In the field of rubber and synthetic rubber there was again much of interest to be seen but it may have been advisable for these exhibitors to show more practical examples of what is being done in this very important field.

**Numbers in parentheses refer to illustrations on pages 714 and 716 in this issue.*

Polythene in Building

A colour film showing how Visqueen polythene film is being used in the building industry has been produced by the I.C.I. Film Unit. Polythene sheeting is also being increasingly used in road-making for which it is used as an underlay, and for 'curing' the concrete.



They're nearly all made best with

Esso

Butyl

Esso Butyl rubber is always uniform in quality and is made in a range of grades which can be compounded to meet individual requirements — both black and coloured. Esso, pioneers in the manufacture of Butyl rubber, are continually finding new uses for it in an ever-widening variety of industries.

The man-made rubber with the greatest resistance to

AGEING and SUNLIGHT

OZONE and CORONA DISCHARGE

HEAT

MOISTURE

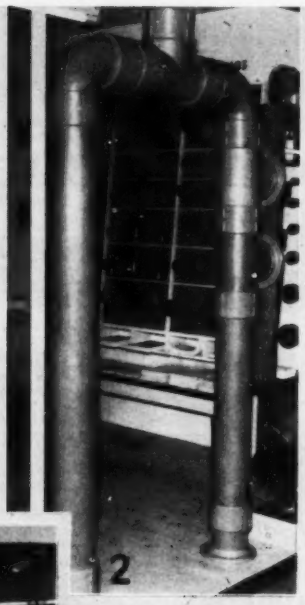
CHEMICALS and GASES

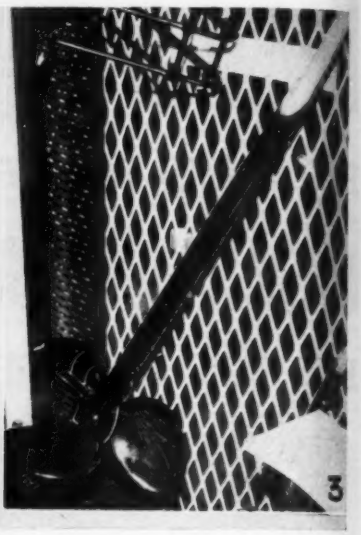
ABRASION

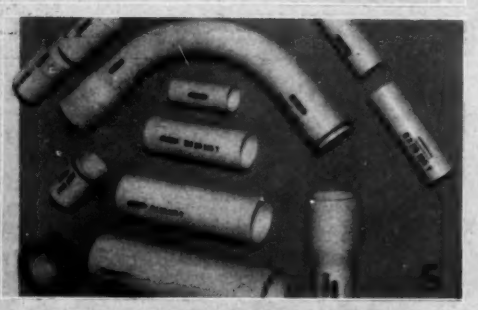
CRACKING

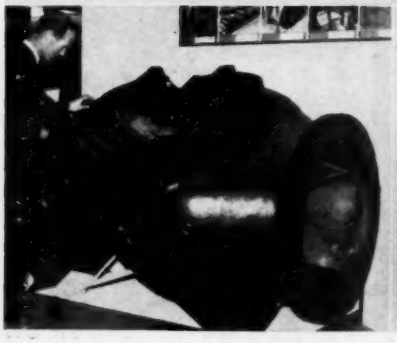
Esso Butyl is identical to 'Enjay' Butyl which has established a high reputation in the United States

ESSO PETROLEUM COMPANY, LIMITED, Chemicals Dept., 36 QUEEN ANNE'S GATE, LONDON SW1









Corrosion Exhibition

A description of some of the products which were on show at the Corrosion Exhibition appears on page 712 in this issue. The products are as follows: 1, Extraction hood assembly (A. E. Griffiths Ltd.); 2, thermoplastic tubing (H. Incledon and Co.); 3, polythene-coated propellor shaft (Durable Plastics Ltd.); 4, ebonite moulding (Dunlop); 5, PVC tubing (Shell); 6, resin-branded glass fibre tubing (K. W. Chemicals Ltd.); 7, epoxy resin tube and valve (CIBA (ARL) Ltd.); 8, synthetic rubber-lined casting (Anglo-American Synco Corporation); 9, roof ventilator fan unit (A. E. Griffiths Ltd.); 10, ducting extraction fan (K. W. Chemicals Ltd.).

'FORTAFIL'

Rubber Reinforcing Filler

is granular in form

Because of this,
'Fortafil' *effectively reduces the dust nuisance.*
'Fortafil' *is therefore more convenient and hygienic to handle.*
And in addition, 'Fortafil' *is easily dispersed during compounding, and has superior reinforcing properties.*

These are the salient facts about 'Fortafil' A70 (aluminium silicate). If you would like full technical details, please fill in the coupon and post it to:

IMPERIAL CHEMICAL INDUSTRIES LTD., LONDON, S.W.1.

ICI

Please send your free booklet on 'Fortafil' A 70

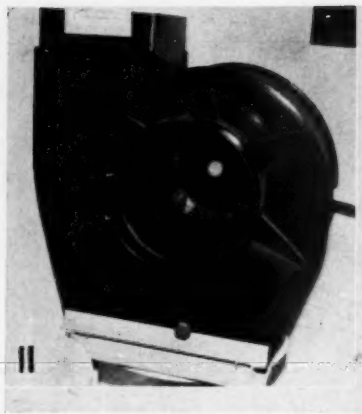
NAME.....

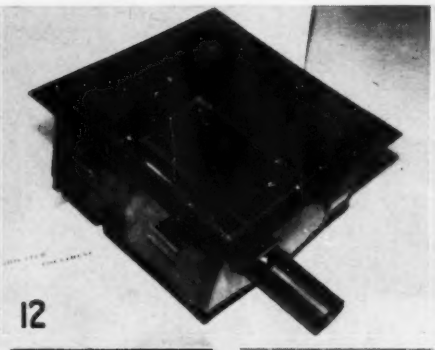
COMPANY.....

ADDRESS.....

.....

CN 203

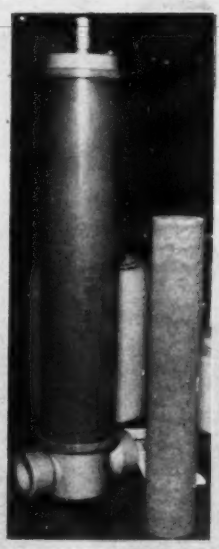


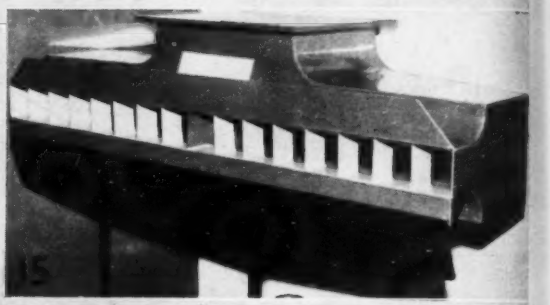


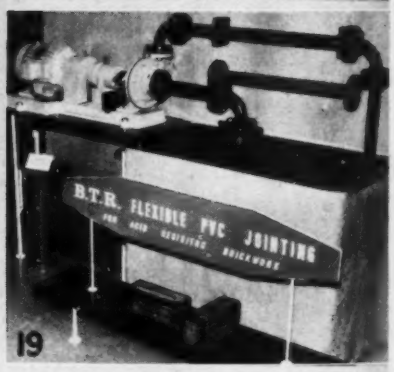
CORROSION EXHIBITION

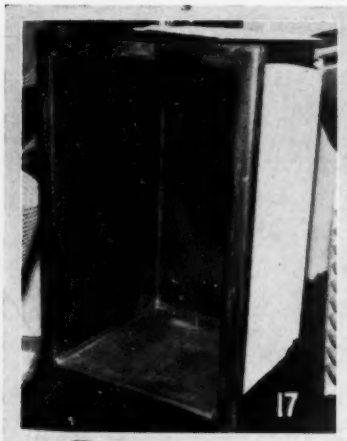
(continued)

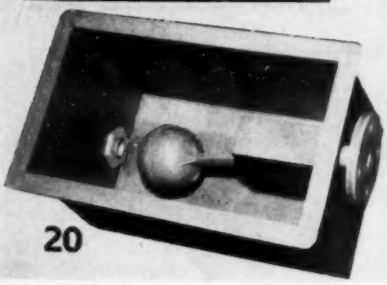
11, 14-in. fan (Plastic Constructions Ltd.); 12, polythene tank (Prodorite Ltd.); 13, glass fibre chemical tank (Fibreglass Ltd.); 14, PVC filter unit casing (Doulton); 15, lip extractor unit (BX Plastics Ltd.); 16, glass fibre reinforced tissue (Fibreglass Ltd.); 17, rubber-lined tank (Nordac Ltd.); 18, fan unit and portable pump (K.W. Chemicals Ltd.); 19, vulcanite-lined pump and pipe work (BTR); 20, plastic tank with ball valve (F. Hayworth (ARC) Ltd.); 21, glass fibre tray (A. E. Griffiths Ltd.); 22, synthetic rubber-coated bilge pump (Protective Rubber-Coatings (Bristol) Ltd.).

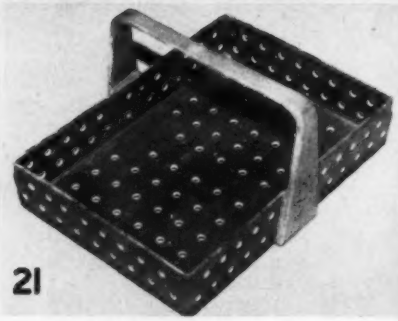












EVERY TYPE OF

CALCIUM CARBONATE

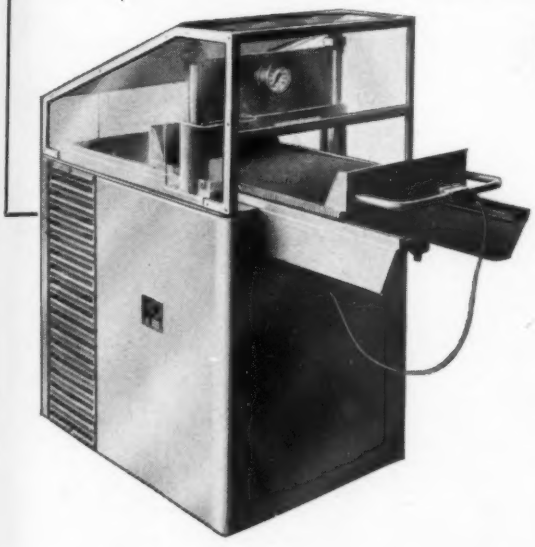
Whether you call it —

ACTIVATED **PRECIPITATED**
WHITING **CHALK**
LIMESTONE FLOUR

Is available in our range for Rubber or PVC

WITCO CHEMICAL CO., LTD.

Head Office: **BUSH HOUSE, ALDWYCH, LONDON, W.C.2**
Telephone: TEMple Bar 6473/6476
PEARL HOUSE, PRINCESS ST., MANCHESTER 2 (Central 9066/8) 62 ROBERTSON ST., GLASGOW C.2 (City 3495)
Works at: **UNION LANE, DROITWICH SPA, WORCESTERSHIRE**
Also at · NEW YORK · CHICAGO DETROIT · AKRON · BOSTON · CLEVELAND



SYNTHETIC RUBBER BALE CUTTER

For Standard size 26″ x 13″ x 9″, alternatively for cylindrical bale 15″ dia. x 20″ long; self-contained motorised Pumping Unit mounted in base ; fast action ; Perspex guard ; simple to install. No foundation required. Will slice to $\frac{3}{8}$″ thickness.

REED BROTHERS
(ENGINEERING) LIMITED

REPLANT WORKS, WOOLWICH INDUSTRIAL ESTATE, LONDON, S.E.18

Phone: Woolwich 7611/6 Grams: Replant London S.E.18

Rubber Markets

LONDON

The advance in prices in the London rubber market has continued apace during the past week and a further all-round rise of around 1½d. per lb. has been recorded. The Spot is 1⅝d. up at 30¾d. per lb. The fresh rise reflects the strength of the market in the East and this in turn was due to persistent buying on the belief that the outlook for the commodity is good. Future supplies are expected to be tight as there is no sign that production can rise sufficiently to meet the expected higher demand.

Latest prices are as follows:

No. 1 RSS Spot: 30⅝d.-30⅞d.

Settlement House:

June 30¾d.-31d.

July/September 31d.-31⅛d.

October/December 30⅞d.-31⅛d.

January/March 30⅞d.-31d.

April/June 30¾d.-30⅞d.

No. 1 RSS cif basis ports:

May 30¾d. nominal.

June 30¾d. nominal.

Godown:

May 106½ Straits cents nominal.

LATEX

Centrifuged latex per gallon in drums, May/June shipment, 17s. 9d. seller, cif European ports. Spot, seller, 18s. 2d. Bulk, seller, 18s. Creamed, seller, 17s. 6d. Normal, seller, 13s. 6d.

AMSTERDAM

The Amsterdam rubber market ruled as follows on May 4:

No. 1 RMA	Guilders per kilo May 4	Previous
May	2.85	2.79
June	2.85	2.79
July	2.90	2.82
August	2.90	2.82
September	2.90	2.82
July/September ..	2.91½	2.82
October	2.90	2.82
November	2.90	2.82

Sales: 15 Tendency: Firm

DJAKARTA

The movement was again upward on May 4 on renewed demand reflecting better overseas advices. The close was very steady with spot No. 1 priok at 28.80 rupiahs per kilo buyers against 28.25 at the previous close.

	Rupiahs per kilo May 4	Previous
Spot No. 1 Priok ..	28.80b	28.25
Spot No. 2 Priok ..	28.00b	27.60
Spot No. 3 Priok ..	26.75b	26.25
No. 1 fine pale crepe	26.00b	25.75

Tendency: Very steady

BANGKOK

No. 1 RSS

The price for No. 1 RSS, at Bangkok on May 4 was 32.57 (32.37½) US cents per lb.

NEW YORK

The following prices ruled in New York on May 4:

DEALERS' PRICES

	US cents per lb., ex-dock May 4	Previous
No. 1 RSS, May	36⅛b–36⅜a	35⅜b–35⅝a
June	36⅛b–36⅜a	35⅜b–35⅝a
No. 2 RSS, May	36b –36⅛a	34⅞b–35⅛a
June	36b –36⅛a	34⅞b–35⅛a
No. 3 RSS, May	35⅜b–36a	34⅜b–35⅛a
June	35⅜b–36a	34⅜b–35⅛a
No. 1 RSS, Spot	36⅛b–36⅜a	35⅜b–35⅝a
No. 3 amber blanket crepe, July ..	34⅛n	33⅛b–33⅜a
No. 1 latex, thin crepe, May ..	35⅛n	34⅛n
No. 1 latex, thick crepe, May ..	35⅛n	34⅛n

FUTURES—REX CONTRACT

US cents per lb.	Close	Prev. Close
May ..	26.25b–37.00a	35.70b–36.00a
July ..	36.35b–36.55a	35.85–36.00t
Sept. ..	36.25t	35.80–35.90t
Nov. ..	35.80t	35.60t
Jan. ..	35.80t	35.45b–35.55a
March ..	35.55b–35.65a	35.35t
May ..	35.45b–35.60a	35.25b–35.35a

Sales: 122 Tendency: Very firm

Rubber futures were quite firm on May 4, about ½ a cent or so up for the day on covering and speculative buying. Dealings were active. Traders said that strength in Singapore and limited shipment offerings from the Far East, with prices up about a cent a lb. in the offered side spurred the buying on the exchange. The end of the US Rubber Company strike and favourable prospects for the end of the Firestone and Goodrich strikes also helped the buying. Traders later said that factories such as Goodyear and General Tyre were absorbing any rubber offered at reasonable prices. Business was done in three and four ribbed sheets and number three ambers on a shipment basis for May position at ⅜ of a cent above Friday's levels.

CEYLON

No. 1 RSS

The price for No. 1 RSS, spot, at Colombo on May 4 was 130 (127) Ceylon cents per lb.

SINGAPORE

Prices were marked up sharply at the opening on May 4 in sympathy with overseas advices and the United States rubber strike agreement. The market then ruled quiet at the higher level fluctuating within narrow limits. Lower grade interest was small and selective and factories were quiet. The afternoon opened with a further sharp advance and renewed bull buying which brought some short-covering in its wake. Lower grades were neglected. At the higher level there was some profit-taking but for most of the day buyers had to pay sellers' prices. Afterhours, the market continued steady.

Straits cents per lb., fob Malayan ports to open ports	Close	Previous Close
No. 1 RSS, May	103⅜–104	100⅛–100⅜
June	103⅜–104	100⅜–101
No. 2 RSS, May	102 –102½	99⅛– 99⅜
No. 3 RSS, May	101 –102	98⅛– 98⅜
No. 4 RSS, May	99½–100⅛	96⅛– 97⅛
No. 5 RSS, May	98 – 99	95 – 96
No. 1 RSS, Spot	103⅛–103⅜	100⅛–100⅛
No. 3 blanket, thick remilled, May ..	96⅛– 98⅛	94⅛– 96⅛
No. 1 fine pale crepe, May ..	105 –107	103 –104
2X thin brown crepe, May ..	98⅛– 99⅛	97⅛– 98⅛

Tendency: Steady

The Industrial Syndicate quote latex, native produce, 60% centrifugal, packed in rec. drums fob at 205.80d. per gallon.

COMPANIES in the NEWS

Dunlop Rubber Co.

Although the Dunlop Rubber Co.'s group trading balance for 1958, at £19,761,000, was slightly lower than in the previous year, the available net profit after tax was £550,000 up at £3,567,000. Preference dividends less tax amounted to £456,000 (£451,000 in 1957), and £1,100,000 (£1,000,000) has been transferred to reserves.

The company's directors recommend a final dividend of 1s. 2½d. per 10s. stock unit, making, with the interim dividend paid in November 1958 a total dividend of 1s. 7½d. per 10s. stock unit. The ordinary dividend will absorb £1,995,000 (£1,559,000).

The directors will submit to the stockholders proposals to increase the authorized capital from £40 million to £50 million and to capitalize £5,241,440 of the company's reserves and apply this amount in the issue to ordinary stockholders on the register on May 5 1959 of fully-paid stock in the proportion of 1 for 4. They wish to emphasize that this is not intended to imply any increase in the total amount of dividend which may be distributed in future.

Advocate Mines

Foundations for the test plant being built by Advocate Mines on its Newfoundland asbestos property are two-thirds completed and should be finished in another month, shareholders were told at the annual meeting. Material and equipment for the plant have been assembled and should be shipped to the property in May. The plant will be completed this summer and factual results on the additional drilling being done will be available in September. Results to date from the $1,500,000 confirmatory programme have been very satisfactory, President E. R. E. Carter said.

PUMPING LATEX FROM SHIP'S TANKS AT HULL Ddocks using GRESHAM'S

Photo by Courtesy of International Bulk Liquids (Storage & Transport) Ltd

COMPRESSED AIR OPERATED
Ejectopump
BRITISH PATENT No. 588792

Self Priming—No water needed. No lubrication—Minimum Maintenance. Suction lifts up to 15 feet. Discharge heads up to 50 feet. Sizes 1½" to 6". Capacities 600 to 10,000 galls. p.h. already in daily use in ports for pumping direct from ships' tanks to shore installations and in factories for transfer and process work.

NO GLANDS NO CHURNING
NO BEARINGS NO AERATION
NO ROTATING PARTS NO CONTAMINATION

Send for list 70f

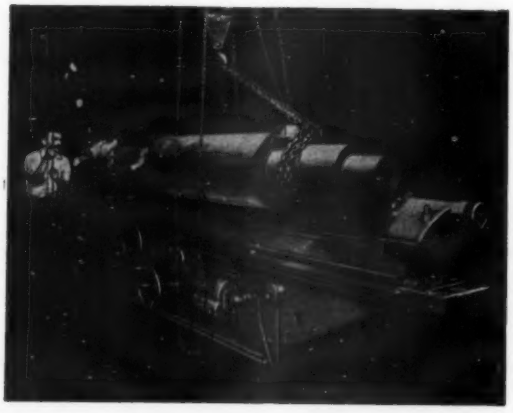
Phone: *Deansgate* 6061/4

GRESHAM & CRAVEN LTD
Dept. B ORDSALL LANE SALFORD · MANCHESTER 5

Grams: *Brake Phone Manchester*

London Office and Sales: 15 WHITEHALL, S.W.1 *Cables: Loco Brake London* *Telephone: Trafalgar* 6611

MILLS CONVERTED TO NEW SAFETY STANDARDS



INSTALLATION MAINTENANCE

REPAIRS NEW MACHINES

SPARE PARTS FOR ALL TYPES OF INDUSTRIAL PLANT

UNITS HANDLED UP TO FOUR TONS

•

ROLL GRINDING A SPECIALITY

JAMES H. PULLEN (1942) LTD.

ROTHERMERE ROAD WADDON SURREY *Telephone: Croydon 6067/8*

Industry INTELLIGENCE

Technical Data

Neoprene Type WB

Two recent du Pont reports are devoted to certain aspects of Neoprene Type WB. Report BL–346, by G. B. Ritzinger, relates to its use in wire and cable compounds while Report BL–347, by R. M. Murray, shows how Neoprene Type WB can be compounded to increase its resistance to flex cut growth and its tear strength. These reports are issued by the Elastomer Chemicals Department, E. I. du Pont de Nemours and Co. (Inc.), Wilmington 98, Del., USA.

Report BL–346 contains data showing the effect of progressive substitution of Type WB for Type W in a typical heater cord compound. With increasing content of Type WB, extrusion smoothness is improved although tensile strength and elongation are somewhat impaired. However, increasing amounts of Type WB have little or no effect on the percentage retention of original tensile strength and elongation after heat ageing and oil immersion, or on insulation resistance. The degree of improvement in extrusion smoothness is in direct proportion to the amount of Type WB in the blend, 25% being adequate in many cases.

In Report BL–347 it is shown that the resistance to flex cut growth and the tear strength of Type WB can be improved by blending with Type W and by suitable selection of curing systems, antioxidants and plasticizers. Compounds containing 60 phr of MT black were used for this work and three of the compounds containing blends of Type WB and Type W have given smooth, trouble-free processing in factory use. Abrasion resistance of Types WB and W was compared in compounds containing 58 phr of SRF black. Type WB showed lower abrasion resistance than Type W. but nevertheless it should be satisfactory in this respect for many applications.

Resin-bonded Coatings of PTFE

A new range of resin-bonded dispersions of PTFE, under the trade mark 'Emralon,' is being manufactured by Acheson Colloids Ltd., 70 Hill Street, Richmond, Surrey.

The advantages of these dispersions over pure PTFE films are said to be: (a) They can be applied to heat sensitive surfaces; (b) a much improved adhesion is obtained; (c) the coatings have greater resistance to wear; (d) they are more resistant to corrosion.

At present two dispersions in the range are available. 'Emralon' 810, employing a phenolic binder, is applied by air spray and requires curing for one hour only at 150°C. The green coatings produced are described as tough, flexible, adhesive, non-soiling, corrosion resistant and with low friction characteristics. Dispersion properties are given as: Pigment, polytetrafluoroethylene. Binder, phenolic type resin. Flash point, 46°F. Density, 9.9lb./gal. Consistency, liquid. Shelf life, two months as shipped. Other characteristics include: Friction coefficient, 0.05–0.07. The film will withstand 200°C. for limited periods and 175°C. in continuous use.

'Emralon' 820, which can be applied by spraying or dipping, contains a thermoplastic binder and needs no heat curing. It is thus designed for application to surfaces which are too sensitive even for the 'Emralon' 810 low curing temperature or for use where baking is impracticable. The turquoise coating will harden in air at room temperature in two hours.

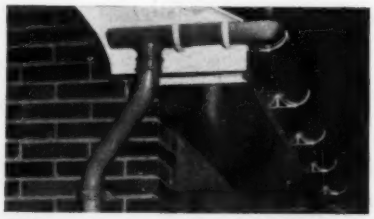
Dispersion properties are given as: Pigment, PTFE. Binder, thermoplastic resin. Flash point, 40°F. Density, 9.7lb./gal. Consistency, liquid. Shelf life, two months as shipped. The friction coefficient of the film as applied will be between 0.05 and 0.07.

Trial packs and information on these dispersions can be obtained from Acheson Colloids Ltd., P.O. Box No. 12, Prince Rock, Plymouth.

Machines, Materials and Equipment

PVC Rainwater Products

The Marley Group, of Sevenoaks, Kent, has commenced the manufacture of rainwater goods of rigid PVC.



PVC rainwater pipe and guttering manufactured by the Marley group

Initially they are being manufactured in traditional sizes—2½in. down pipe, 4in. half-round gutter, in 6ft. lengths, with all the normal fittings in rigid PVC, but it is intended to produce larger sizes for industrial use in the near future. The wall thickness is 3/32in. For an initial cost that is, according to the makers, comparable to cast-iron, Marley PVC rainwater goods need absolutely no painting or maintenance, either at installation or any time later. The whole system is light in weight, easy to handle, and readily transported. Fixing is simple; a gutter bracket of special design is supplied specifically for this purpose, and no gutter bolts are required. The lengths can easily be cut.

100% Silicone Aerosol

Considerable savings in costs, with a new valve and a larger container permitting the use of more silicone and less propellant, have been made by Solvolene Lubricants Ltd., Reginald Square, London, S.E.8, in the manufacture of their new 100% silicone aerosol. The new unit, with 16oz. capacity, is being made available, states the company, at a cost approximately 30% below the present accepted price level for parallel products.

Publications Received

Union Carbide Aldehydes

A new booklet, 'Aldehydes,' RF-5278D, available from the Chemicals Department, Union Carbide International Co., Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, replaces an earlier compendium on aldehydes published by the company. New commercial products in this edition include propionaldehyde, glutaraldehyde, and acrolein dimer. Also mentioned are three newer aldehydes (valeraldehyde, iso-pentaldehyde and iso-decaldehyde) available as introductory products. A section on storage and handling, including specific data on types of shipping containers, has been added. Comprehensive data on physiological properties, an enlarged section on specifications and test methods, and a new bibliography complete the revisions over the old edition.

'Drum-Master' Handling Equipment

Powell and Co., Burry Port, Carms., South Wales, has issued publication No. DBC 4 which deals with drum handling. The company manufactures handling equipment for a large variety of containers including barrels of all sizes, gas cylinders and carboys, etc. Miscellaneous equipment — in connexion with drum and bulk liquid handling—stainless buckets, drain trays, taps, drum keys, and drum opening tools, etc., is also available.

Diethyl Succinate

The physical, physiological and chemical properties of diethyl succinate are presented in a new 4-page bulletin available on request from the Chemicals Department, Union Carbide International Company, 30 East 42nd Street, New York 17, USA.

Diethyl succinate is useful as an intermediate for mordants and plasticizers, and for quinacridone pigments which are highly stable to both light and heat.

International Plastics Exhibition

RECENT DEVELOPMENTS IN GLASS REINFORCED PLASTICS

VARIOUS aspects of recent developments in glass reinforced plastics will be discussed at the International Plastics Exhibition Convention. Three experts will give papers.

Developments in the Benelux countries will be dealt with by Roelf Tunteler of the Plastics Research Institute, Delft, Holland. He will describe how, after World War II, the first data concerning the possibilities of glass fibres reinforced plastics became gradually known in the Benelux countries. These data interested many people, because they demonstrated clearly the possibility of fusing organic plastics as construction materials. Consequently, many firms studied the situation from their respective standpoints as possible manufacturers of either raw materials or resins, or as moulders. Of all these firms only a few actually entered the field. The result is an industry which is able to cover all the aspects of this complicated matter. In the paper, a general survey of the present Benelux situation as to glass fibres reinforced plastics will be given. Attention will be paid to raw materials, resins, moulding methods and finished products.

Progress in the United Kingdom will be outlined by Brian Parkyn, of Scott Bader and Co. Ltd., Wollaston. Developments in reinforced plastics in the UK have been rapid in recent years. Many of the technical advances were reported at the Reinforced Plastics Convention at Brighton last October, and this paper concentrates on reviewing such advances in reinforcements, resins, catalysts, pigments, pre-mixes and dough moulding. Some of the outstanding work on performance characteristics both in the laboratory and in service are discussed and recent developments in processing and fabricating techniques described.

An account of advances in the United States will be given by Harrison C. Blankmeyer, of the Reinforced Plastics Development Owens-Corning Fiberglass Corporation, Ashton, Rhode Island. He will describe how the advent of new resins and catalyst systems, together with special performance requirements in military and commercial service, has commanded equivalent advances in reinforcement technology. Concurrently, the expanding use of reinforced plastics by design engineers has accented the necessity of providing design criteria with established confidence levels. This has been met in part by both federal and private research funds resulting in a variety of sound publications. The challenges of replacing metal parts, where appropriate, provide a series of interesting case histories in product design, development and fabricating economics. The practical concept of a development organization to initiate and exploit these opportunities is described.

USSR Delegation

The delegation representing the USSR plastics industry has just completed a two-week visit to this country. The delegation studied both the raw materials production and the processing machinery side of the British plastics industry. The visit was arranged by Baker Perkins Ltd., Wogan Machinery Ltd., and R. H. Cole Ltd.

The delegation was headed by Mr Ivan Karataev, vice-president of the Moscow Region Economic Council.

Among the organizations visited were Bakelite Ltd., B.I.P. Ltd., B.X. Plastics Ltd., E. K. Cole Ltd., Baker Perkins Ltd., Whiffen Ltd., Shell Petroleum Ltd., Armoride Ltd., Lansil Ltd., General Engineering Ltd., Commercial Plastics Ltd. and Granbull Tool Co. Ltd.

Rubber Statistics and Patent Specifications

Owing to space problems, two of our regular features, Rubber Statistics and Patent Specifications, have been omitted this week.

Mr J. A. Clovis, after a number of years of service with the company, has been appointed to the board of directors of Wilfrid Smith Ltd.

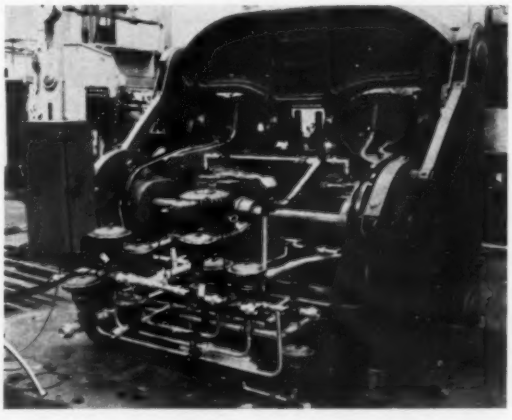
TRADE MARKS

Objections to the registration of any of the undermentioned applications may be lodged with the Comptroller-General of Patents, Designs and Trade Marks at the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, within one month of the date mentioned. The objections must be stated on Trade Marks Form No. 7, cost £2, obtainable through any money order office. The extracts—from 'The Trade Marks Journal'—given below are reproduced by permission of the Controller of H.M. Stationery Office.

ACMETYLE (784,187) For flooring tiles made of rubber, thermosetting plastics, polyvinylchloride plastics, or of cork. By the Acme Flooring and Paving Co. (1904) Ltd., River Road, Barking, Essex. To be associated with No. 615,576 (3326, 498) and another. (Class 19; March 19 1959.)

DRYLENE (783,228) For synthetic textile monofilaments made principally of polythene plastics for use in the manufacture of ropes and of scourers for pans. By Plasticisers Ltd., 135 Skellow Road, Skellow, near Doncaster, Yorkshire. (Class 23; March 25 1959.)

GLACIER DQ (782,070) For parts of machinery included in Class 7 and made principally of mixtures of polytetrafluoroethylene plastics, powdered metal and graphite. By the Glacier Metal Co. Ltd., 368 Ealing Road, Alperton, Wembley, Middlesex. To be associated with No. 612,012 (3296, 204) and others. (Class 7; April 1 1959.)



The intricacy of the pipework necessary to make 45in. Bag-o-matic presses, manufactured by Francis Shaw & Co. Ltd., fully automatic is clearly shown in the illustration. Each pipe is carefully placed to make it easy to trace and a very complicated arrangement of electrical wiring (not shown) is also necessary in the machine

PATENT LIST

Printed copies of the Specifications in the following list can be obtained from the Patent Office, 25 Southampton Buildings, Chancery Lane, London, W.C.2, price 3s. 6d., including postage, but about six weeks after the date of this publication will usually elapse before they come available. Orders with remittance may be sent in advance to the Patent Office, and will be fulfilled immediately the Specifications are published.

COMPLETE SPECIFICATIONS ACCEPTED

Open to public inspection on April 29 1959

Manufactures des Glaces et Produits Chimiques de Saint-Gobain, Chauny and S. A. Cirey des. Manufacture of fibres from thermoplastic materials. 812,657.

Imperial Chemical Industries Ltd. Ethylene polymerization. 812,602.

Stamicarbon N.V. Process for preparing alkene nitriles. 812,780.

Escambia Chemical Corporation. Process for the production of acrylonitrile. 812,475.

United States Rubber Co. Methods of making microporous material. 812,564.

British Oxygen Co. Ltd. Production of decorated melamine resin mouldings. 812,572.

E. I. du Pont de Nemours and Co. Simultaneous extrusion and foaming of plastic materials. 812,798.

Continental Gummi-Werke A.G. Apparatus for the application of lengths of fabric to the drums of tyre-forming machines or the like. 812,581.

Spinnfaser A.G. Method of producing viscose rayon stable fibres with a particularly high degree of crimping. 812,728.

Open to public inspection on May 6 1959

Barwell Rubber Co. Ltd., J. H. Barwell and D. J. Lanham. Methods and apparatus for use in the remoulding of pneumatic tyres. 812,908.

Commonwealth Engineering Co. of Ohio. Method and apparatus for the deposition of metallic coats on rovings of glass fibre. 812,930.

Schueler Automatic Foundry Processes Ltd. Production of articles from an intimate mixture of a finely divided material and a thermosetting resin. Addition to 735,355. 813,064.

Rubber Journal and International Plastics CLASSIFIED ADVERTISEMENTS

APPOINTMENTS VACANT

6d. a word, Minimum 10/- Box 2/-

ADHESIVE TAPES LIMITED require young assistant chemists for interesting project work in the rubber processing, emulsion and coating field. Applicants (under 27) should be of H.N.C. or equivalent standard with some industrial laboratory experience. Apply in writing giving full particulars to:—Personnel Manager, Adhesive Tapes Limited, Boreham Wood, Herts. (24)

CHEMIST required with experience in compounding natural and synthetics and of process control. Several years' proved experience and A.I.R.I. or equivalent preferred.—Details in confidence to Long and Hambly, High Wycombe. (394)

ENGINEER-DESIGNER required for large manufacturing firm in the Manchester area. Experience of rubber and plastics plant and qualifications at least to O.N.C. desirable. Good opportunity for suitable applicant. Pension scheme. Please state experience, qualifications and salary required.—Box 13. (13)

LATEX chemist is required by Greengate and Irwell Rubber Co. Ltd. for their latex division at Melton Mowbray to take charge of routine laboratory and development in a rapidly expanding factory. Superannuation scheme; excellent prospects. Please reply in confidence to:—General Manager, Latex Division, Melton Mowbray, Leics. (18)

TECHNICAL sales engineer required by progressive Midlands firm of synthetic rubber specialists, to expand sales of new material for engineering applications. Good prospects. Apply, giving full details of experience to:—Box 395. (395)

A large Electric Cable Company in the London area requires the services of a RUBBER TECHNOLOGIST with experience in natural and synthetic rubbers. A knowledge of the cable industry and plastics would be an advantage. This position affords an excellent opportunity of acquiring experience of modern cable-making technique both in the factory and in laboratories well equipped with modern pilot-scale plant, with a leading cable manufacturing company.—Reply in the first instance, giving brief details, to Box RJ.600, c/o 191 Gresham House, E.C.2. (9)

APPOINTMENTS VACANT (continued)

WORK study engineer required with experience in process and batch production to take charge of department in medium-size rubber works South London. Senior staff appointment. Pension scheme. Write stating age, experience and salary required to:—Box 27. (27)

ARTICLES FOR SALE (SECONDHAND)

6d. a word, Minimum 12/6 Box 2/-

Exceptional Opportunity

AT REDUCED PRICE TO CLEAR

BERTRAMS 48" x 16" double-geared Mixing Mill with Gear Wheel.

£100

Apply: R. Kemp, 145 St. Vincent Street, Glasgow. Tel. CENtral 8395

(28)

COMPRESSOR SETS

400 c.f.m. BROWETT LINDLEY 120 p.s.i. with LAURENCE SCOTT 95 h.p. slipring motor, 400/3/50.
TWO—330 c.f.m. BROOM AND WADE 100 p.s.i. with BROOK 75 h.p. slipring motor, 400/3/50.
230 c.f.m. INGERSOLL RAND 100 p.s.i. with L.D.C. 60 h.p. slipring motor, 400/3/50.
156 c.f.m. INGERSOLL RAND 100 p.s.i. with BROOK 40 h.p. slipring motor, 400/3/50.
Many others in stock would welcome your enquiries, capacities between 5/2,400 c.f.m. at 100 p.s.i.

GEORGE COHEN SONS & CO., LTD.,
WOOD LANE, LONDON W.12.
Tel.: Shepherds Bush 2070 and
Stanningley, Nr. Leeds, Tel.: Pudsey 2241. (25)